

Expanded Site Inspection
Final Report

Land and Lakes #3
Chicago, Illinois
ILD 000 672 790

March 25, 1996

Prepared for:
U.S. Environmental Protection Agency
under Alternative Remedial Contracting Strategy (ARCS)
Contract 68-W8-0064, Work Assignment 33-5JZZ
ARCS Contractor Project 71280.106

EPA Region 5 Records Ctr.



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1.0 Introduction

On February 4, 1993, the Alternative Remedial Contracting Strategy (ARCS) contractor was authorized, by approval of the work plan amendment by the U.S. Environmental Protection Agency (USEPA) Region V, to conduct an expanded site inspection (ESI) of the Land and Lakes #3 site, Cook County, Illinois.

The site was initially placed on the Comprehensive Environmental Response, Compensation, and Liability Act Information System on August 1, 1980 as a result of a request for discovery action initiated by the Illinois Environmental Protection Agency (IEPA).

The site received its initial Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) evaluation in the form of a preliminary assessment report completed by USEPA on May 14, 1987. A CERCLA screening site inspection report was completed for the site on October 28, 1991. The sampling portion of the ESI was conducted on January 17, 20, and 24, 1994; a field team collected four groundwater samples, fourteen sediment samples, and six soil samples.

The purposes of the ESI have been stated by USEPA in a directive outlining site inspection performed under CERCLA. The directive states:

The objective of the expanded site inspection (SI) is to provide documentation for the Hazard Ranking System (HRS) package to support National Priority List (NPL) rulemaking. Remaining HRS information requirements are addressed and site hypotheses not completely supported during previous investigations are evaluated. Expanded SI sampling is designed to satisfy HRS data requirements by documenting observed releases, observed contamination, and levels of actual contamination at targets. In addition, investigators collect remaining non-sampling information. Sampling during the expanded SI includes background and quality assurance/quality control samples to fully document releases and attribute them to the site. Following the expanded SI, USEPA site assessment managers assign the site a priority for HRS package preparation and proposal to the NPL.

USEPA Region V requested identification of sites during the ESI that may require removal action to remediate an immediate human health or environmental threat.

2.0 Site Background

2.1 Introduction

This section includes information obtained during the ESI and from reports of previous site activities.

2.2 Site Description

Land and Lakes #3 is an active landfill located in an industrial area on the far south side of Chicago (Figure 2-1). The 55-acre site is bounded by 122nd Street on the south, Stony Island Avenue on the west, and Paxton Landfill and Paxton Lagoon on the north and northeast. Lake Calumet lies just west of Stony Island Avenue, and Deadstick Pond is located immediately south of 122nd Street (Figure 2-2).

Land use near the site is industrial and has a history of activities involving hazardous substances, including landfilling and illegal dumping. Eleven waste handling sites have been identified by the IEPA within $\frac{1}{2}$ mile of the site. These sites include hazardous waste generators, landfills, hazardous waste incinerators, treatment facilities, and illegal dumping grounds. Few residences are located near the site; the nearest residential area is located about 1 mile southeast of the site (U.S. Geological Survey [USGS] 1991).

Liquid Recovery Systems, owned by Land and Lakes Company, operates a wastewater treatment facility located at the southwestern portion of the site. The facility treats leachate from other landfills. Treated effluent is discharged to the sanitary sewer system. Land and Lakes #3 has no leachate collection system.

Appendix A includes the 4-mile radius map of the site and the 15-mile downstream distance map.

2.3 Site History

2.3.1 Operational History

Landfilling activities began at the site in 1978. Oily wastes, solid wastes, liquid food waste, waste pigments, and industrial wastewater treatment sludge were accepted. In 1980, it was estimated that the facility accepted 2,000 gallons per week of oily waste, 35,000 cubic yards per month of solid waste, and 87,500 gallons per week of food waste. Exact quantities of wastes landfilled onsite are not known. The facility has a permit to accept municipal waste and non-hazardous special waste.

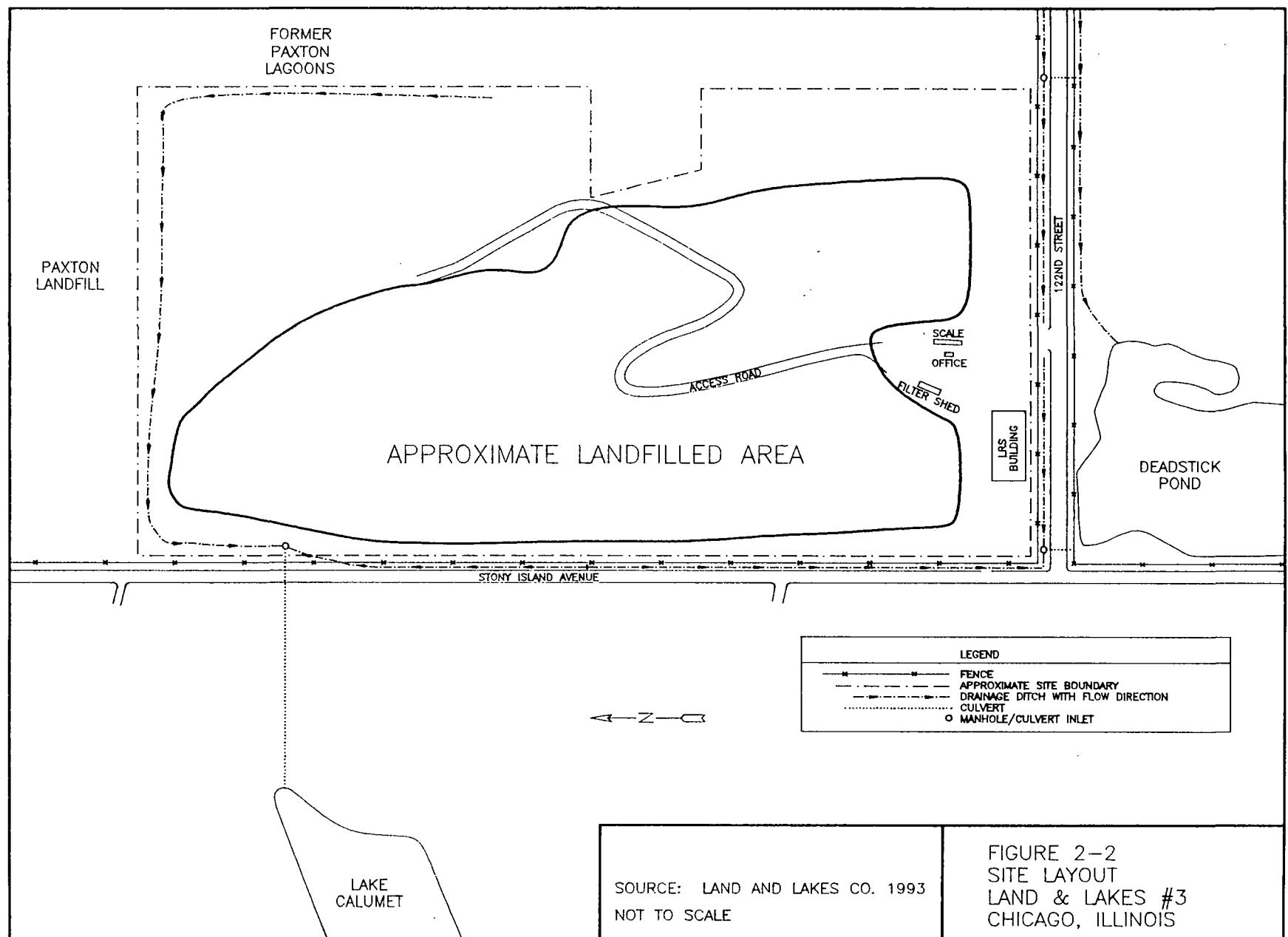


SOURCE: USGS 1991

SCALE (IN MILES):
0 1/2 1

FIGURE 2-1
SITE LOCATION MAP

LAND AND LAKES #3
CHICAGO, ILLINOIS



Land and Lakes #3 continues to accept municipal refuse and IEPA-classified special wastes. Trench and area fill methods have been used in landfilling waste. The natural clay layer beneath the landfill has been reworked during landfilling to prevent releases to the environment. The depth of the waste disposal is approximately 50 feet below grade; the maximum height of the landfill is approximately 70 feet above grade.

Records indicate that hazardous wastes have been accepted. On May 20, 1986, USEPA filed a complaint and compliance order stating that the landfill accepted 8,000 gallons of separator sludge from ARCO Petroleum, 6,000 gallons of waste oil and water and 5,478 cubic yards of hazardous waste water treatment sludge from Environmental Dynamics. Other documentation suggests that two leather processing companies disposed of 7,540 cubic yards of tanning and fishing sludge that contained 2.1 percent by volume of chromium.

During an IEPA site inspection on April 28, 1987, 686 cubic yards of car wash sludge was sampled and the analytical results identified the following heavy metals: arsenic (0.1 mg/l), barium (14 mg/l), cadmium (0.7 mg/l), chromium (2.5 mg/l), copper (15.7 mg/l), cyanide (10.0 mg/l), lead (68.5 mg/l), mercury (0.1 mg/l), nickel (3.6 mg/l), selenium (0.1 mg/l), silver (0.1 mg/l), and zinc (50 mg/l).

Since 1991, Liquid Recovery Systems, Inc., has operated a liquid waste treatment facility onsite. The system treats liquid non-hazardous wastes from offsite sources, including food wastes, landfill leachate, and other wastes requiring solidification. This site houses several above ground storage tanks with the primary tank of concern being a 37,000 gallon tank used to treat leachate from municipal landfills. Analysis of leachate accepted onsite has shown low concentrations of heavy metals. However, system treatment removes heavy metals before effluent from the treatment system is discharged to the sanitary sewer.

IEPA documents indicate that the landfill has a liner consisting of a natural gray silty clay that has been reworked to seal off sand seams and is certified by a geotechnical engineering firm. However, the landfill does not have a leachate collection system. The landfill has had a history of violations cited by IEPA for not having adequate daily and permanent cover. Other documented violations include refuse placed in standing water, leachate seeps, leachate ponds, and offsite pumping of contaminated water. Analysis of groundwater samples collected from onsite monitoring wells from 1978 to 1986 identified organic and inorganic contaminants,

such as ammonia (31 ppm to 110 ppm), boron (1.9 to 2.4 ppm), iron (1.5 ppm), and mercury (2 ppb).

2.3.2 Summary of Onsite Environmental Work

Land and Lakes closed an 18-acre portion of the landfill located along the western edge of the site in 1991. Closure included application of 2 feet of compacted clay and 6 inches of topsoil over the area, with vegetation established on the topsoil. IEPA approved certification of the closure in 1992 (IEPA 1992).

A total of 23 monitoring wells are in place onsite. Eleven wells are screened in the shallow glacial drift, and 12 wells are screened in the Silurian dolomite bedrock. Land and Lakes installed a slurry wall and berm along the eastern and northern site perimeter. Land and Lakes personnel reported that this was installed to prevent leachate from Paxton Landfill and Paxton Lagoons from entering the site.

2.4 Applicability of Other Statutes

Resource Conservation and Recovery Act files list the site as a small-quantity generator (USEPA 1994). A 1991 site inspection by a Field Investigation Team (FIT) contractor for USEPA recommended further investigation of the site contractor.

Land and Lakes has been involved in a dispute with the City of Chicago concerning landfilling in a tract of land at the northeastern portion of site. The City claims that landfilling in this portion of the site, which began in January 1994, violates a City ban on new or expanded landfills that has been in effect since 1983. Land and Lakes stated that the tract was part of a larger parcel that was already approved for landfilling in 1982, before the ban took effect; therefore, it is not an illegal extension. Land and Lakes continues to landfill this portion of the site (Chicago Sun-Times 1994).

3.0 Site Inspection Activities and Analytical Results

3.1 Introduction

This section outlines the procedures used and observations made during the ESI conducted at the Land and Lakes #3 site. Sampling activities were conducted in accordance with the quality assurance project plan (QAPjP) (ARCS Contractor 1991).

ESI samples were analyzed for organic and inorganic substances contained on the USEPA Target Compound List (TCL) and Target Analyte List (TAL) by USEPA Contract Laboratory Program (CLP) participant laboratories. Appendix B presents the TCL and TAL. Appendix C summarizes analytical data generated by ESI sampling. Appendix D contains photographs of the site and sample locations.

3.2 Site Reconnaissance

On September 21, 1993, a reconnaissance of the Land and Lakes #3 site was conducted. This visit included a visual site inspection and interview of site representatives to determine site status and facility activities, health and safety concerns, and potential sampling locations.

Jim Cowhey, Jr. of Land & Lakes Co. and Dave Curnock of Mittelhauser Corp. represented the Land & Lakes Co. during the reconnaissance. Mittelhauser Corp. is a consultant for the Land & Lakes Co. The reconnaissance team explained the purpose of the ESI to the site representatives, toured the site, and gathered site-specific information.

3.3 Sampling Activities

The ESI field team collected sediment, soil, and groundwater samples on January 17, 20, and 24, 1994. Sampling activities did not take place on consecutive days because of extremely cold weather. Weston-Gulf Coast Laboratories, Inc., representatives received split sample volumes of onsite samples for analyses for Land and Lakes Co. Figures 3-1 and 3-2 show sample locations; Table 3-1 summarizes sample descriptions and locations.

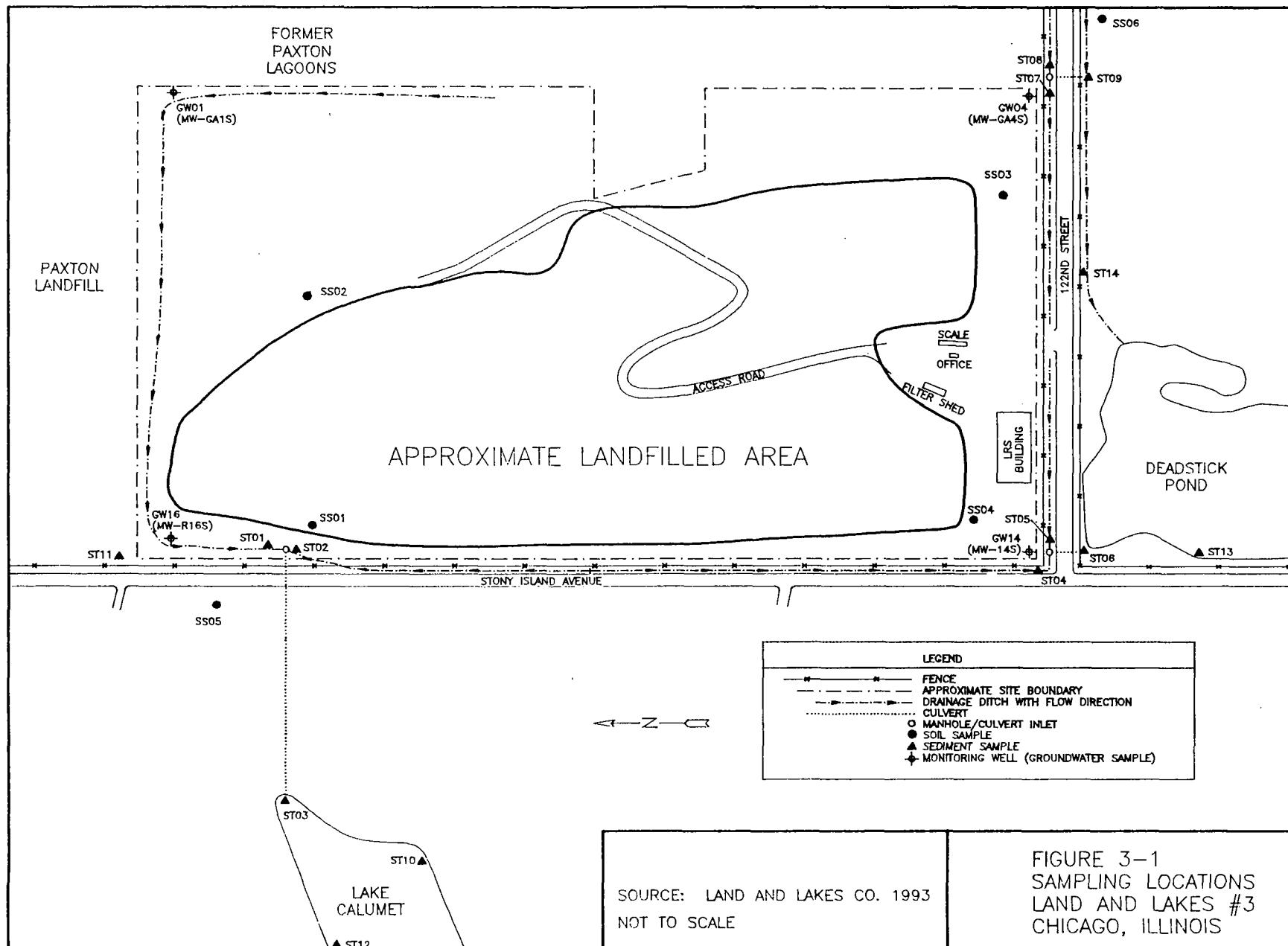


Table 3-1
Sample Descriptions
Land and Lakes #3

| Sample No.* | Depth (feet)** | Appearance | Location |
|-------------|----------------|-------------------------------------|---|
| ST01 | 0.5 to 1 | Gray/brown silty clay w/ brick | In the ditch along the east side of Stony Island Ave., about 30 feet north of the culvert inlet, which drains to Lake Calumet |
| ST02 | 0.5 to 1 | Brown sandy clay | In the ditch along the east side of Stony Island Ave., about 35 feet south of the culvert inlet, which drains to Lake Calumet |
| ST03 | < 2 | Gray saturated silty clay | In Lake Calumet, at the outfall to the culvert, which drains from the site |
| ST04 | < 2 | Saturated silty black muck | In the ditch along the east side of Stony Island Ave., about 25 feet north of 122nd St. |
| ST05 | 1 to 1.5 | Dark brown sandy clay | In the ditch along 122nd St., just east of the inlet to western culvert, which drains to Deadstick Pond |
| ST06 | 0.5 to 1 | Wet gray sandy clay with muck | Offsite, at the outlet to the western culvert, which drains from the site to Deadstick Pond |
| ST07 | < 2 | Moist, dark gray clay | In the ditch along the north side of 122nd St., about 25 feet west of the eastern site boundary |
| ST08 | < 2 | Moist, dark gray/black mucky clay | In the ditch along the north side of 122nd St., about 30 feet east of the eastern site boundary |
| ST09 | < 2 | Gray sandy saturated clay with muck | Offsite, at the outlet to the eastern culvert, which drains the site to Deadstick Pond |
| ST10 | < 2 | Gray saturated sandy clay | At the southern bank of Lake Calumet, about 150 yards southwest of ST03 |
| ST11 | < 2 | Brown sandy silt with vegetation | In the ditch along the east side of Stony Island Ave., about 40 feet north of the northern site boundary |

Table 3-1 (Continued)
Sample Descriptions
Land and Lakes #3

| Sample No.* | Depth (feet)** | Appearance | Location |
|-------------|----------------|---------------------------------------|--|
| ST12 | < 2 | Gray sandy clay with some debris | In Lake Calumet, about 500 feet west of ST03 |
| ST13 | < 2 | Black, wet sandy silt with vegetation | In Deadstick Pond, about 100 yards south of ST06, near the bank of the pond |
| ST14 | < 2 | Saturated brown/black muck | Offsite, in a ditch that flows to Deadstick Pond, about 500 feet west of ST09 |
| SS01 | 1 to 2 | Dark gray silty clay w/ bits of brick | At the northwestern portion of the site, about 12 feet south and 15 feet east of the culvert inlet, which drains to Lake Calumet |
| SS02 | 1 to 1.5 | Dark brown clay with sand and silt | At the northeastern corner of the landfilled area, about 120 feet south of the northern site boundary |
| SS03 | 1 to 2 | Silty gray/brown clay | At the southern portion of the site, about 300 feet west of MW-GA4S |
| SS04 | 1 to 1.5 | Dark gray sandy clay | Near the southwestern corner of the landfilled area, just north of Liquid Recovery Systems parking lot |
| SS05 | 0.5 to 1 | Dark brown sandy silt with vegetation | Offsite, about 40 feet west of Stony Island Ave. and about 200 feet south of the northern site boundary |
| SS06 | < 2 | Dark brown sandy clay with vegetation | Offsite, about 40 feet south of 122nd St. and about 200 feet east of the eastern site boundary |
| GW01 | 12.26 | Cloudy, silty | Monitoring well MW-GA1S, at the northeastern corner of the site |
| GW04 | 11.6 | Cloudy, silty | Monitoring well MW-GA4S, at the southeastern corner of the site |
| GW14 | 8.18 | Cloudy, silty | Monitoring well MW-14S, at the southwestern corner of the site |
| GW16 | 6.10 | Cloudy, silty | Monitoring well MW-R16S, at the northwestern corner of the site |

Table 3-1 (Continued)
Sample Descriptions
Land and Lakes #3

- * Sample numbers are made up of four alpha numerics (two letters followed by two numbers). The two letters designate the type of media sampled and the two numbers designate the different sample locations for each media: Soil (SS); sediment (ST); and groundwater (GW).
- ** Depth represents the distance below land surface. For groundwater samples, it represents the distance from top of the well riser to the groundwater.

Sample activities were conducted in accordance with procedures set forth in the QAPjP. Sample jars were sealed, labeled, packaged, and transported to USEPA CLP participant laboratories. Table 3-2 presents laboratory information according to media sampled and analyses performed.

Reusable sampling and personal protective equipment (PPE) were decontaminated before transport offsite. Disposable sampling equipment and PPE were discarded in accordance with procedures outlined in the ESI project work plan and the QAPjP.

3.3.1 Sediment Sampling

Fourteen sediment samples were collected to characterize sediment conditions in background locations, in onsite ditches, and in Lake Calumet and Deadstick Pond. Sediment samples were collected to evaluate conditions in the surface water pathway.

Four investigative sediment samples and 2 background sediment samples were collected in Lake Calumet and in drainage pathways leading to Lake Calumet. ST01 and ST02 were collected from the north and south sides of the culvert inlet leading to Lake Calumet. ST03 was collected in Lake Calumet at the culvert outfall, and ST12 was collected west of the outfall. ST10 and ST11 were collected to characterize background sediment conditions. ST10 was collected from the southern shore of Lake Calumet, in a location where offsite drainage was likely to enter the lake. ST11 was collected from the ditch between Stony Island Avenue and Paxton Landfill. This ditch drains to Lake Calumet through the same culvert that drains the site.

Table 3-2
Laboratory Information

| Media | Analyses | Laboratory |
|--------------------------------|-----------|--|
| Soil | Organic | Encotec Ann Arbor, Michigan |
| | Inorganic | Weyerhaeuser Analytical and Testing Services Federal Way, Washington |
| Sediment and Groundwater | Organic | Analytical Resources, Inc. Seattle, Washington |
| | Inorganic | Southwest Labs of Oklahoma Broken Arrow, Oklahoma |

Seven investigative sediment samples and one background sediment sample were collected from Deadstick Pond and drainage pathways leading to Deadstick Pond. ST04, ST05, and ST07 were collected from onsite drainage ditches. These onsite ditches drain to culverts that lead to Deadstick Pond. ST09 and ST06 were collected from culvert outfalls that discharge site drainage. ST06 was collected at the outfall to the culvert draining to Deadstick Pond, and ST09 was collected from a ditch leading to Deadstick Pond. ST13 was collected from Deadstick Pond, about 100 yards south of ST06. ST14 was collected from a ditch leading to Deadstick Pond, about 500 feet west of ST09. Background sediment sample ST08 was collected offsite, east of the eastern culvert inlet.

3.3.2 Soil Sampling

Four investigative soil samples and 2 background soil samples were collected. Investigative samples SS01 through SS04 were collected onsite, near the perimeter of the landfilled area, to assess general soil conditions. Samples SS01 through SS04 were collected from the northwest, northeast, southeast, and southwest site quadrants, respectively. Samples SS05 and SS06 were collected from offsite locations northwest and southeast of the site, to establish background soil conditions.

3.3.3 Groundwater Sampling

Four groundwater samples were collected from onsite monitoring wells, which are screened in the glacial drift. One sample was collected from each of the following wells: MW-GA1S, MW-GA4S, MW-14S, and MW-R16S. Groundwater

no appropriate background groundwater sampling location was available. Groundwater samples were not evaluated to determine key samples, because background samples used in key sample evaluation. Multiple background samples were used to determine key soil and sediment samples. Key soil and sediment samples meet or exceed key sample criteria for all samples. Key samples that contain sufficient concentrations of substances, in comparison to background concentrations, to document an observed release. Table 3-3 identifies ESI key samples and associated background releases, in those samples that contain sufficient concentrations of "key samples" are those samples that contain sufficient concentrations of substances, in comparison to background concentrations, to source characterization and concentrations, in comparison to background concentrations, to document an observed release.

3.5 Key Samples

Appendix C presents ESI analytical data for groundwater, soil, and sediment samples. Analytical results are discussed with respect to source characterization and potential impact on migration pathways in sections 4.0 and 5.0.

3.4 Analytical Results

Sampling was conducted to aid in characterization of hazardous substances landfilled onsite. Shallow onsite groundwater is likely to be affected by potential releases of hazardous substances present in the landfill. No appropriate background groundwater sampling was conducted to locate an appropriate background sampling location. Because shallow groundwater conditions rather than document release, further study of the shallow groundwater was not conducted.

Table 3-3
Key Sample Summary

| Substance | Sediment (concentrations in ug/kg) | | | | | | | | | | | | | |
|----------------------|------------------------------------|----------|-------|-------------------------|-------------------------|------|----------|------|---------|------|-------------------------|----------|----------|-------|
| | ST01 | ST02 | ST03 | ST10 Back- ground | ST11 Back- ground | ST12 | ST04 | ST05 | ST06 | ST07 | ST08 Back- ground | ST09 | ST13 | ST14 |
| Methylene Chloride | | | 83 | 16 U | 12 U | | | | | | | | | |
| Acetone | | | 120 | 21 | 12 U | | | | | | | | | |
| 1,2-Dichloroethene | | | | | | | | | | 38 | 18 U | | | |
| Ethylbenzene | | | | | | | | | | | | 30 | 840 | 100 J |
| Xylene(total) | | | | | | | | | | | | 130 | 3,300 | |
| Phenol | | | 2,100 | 520 U | 390 U | | | | | | 2,500 | 1,000 U | | |
| 4-Methylphenol | | | 890 | 520 U | 390 U | | | | | | | | | |
| Acenaphthene | | 690 | | 520 U | 390 U | | | | | | | | | |
| Fluorene | | 870 | | 520 U | 390 U | | | | | | | | | |
| Phenanthrene | | 7,400 D | | 580 | 1,400 | | 12,000 | | | | | 3,000 | | |
| Anthracene | | 2200 | | 520 U | 420 | | | | | | | | | |
| Carbazole | | 930 | | 520 U | 390 U | | | | | | | | | |
| Fluoranthene | | 12,000 D | | 770 | 2,600 | | 19,000 D | | | | | 3,900 | | |
| Pyrene | | 9,300 D | | 700 | 1,900 | | 17,000 D | | 8,800 D | | | 2,800 | | |
| Butylbenzylphthalate | | 520 | | 520 U | 390 U | | | | | | | | | |
| Benzo(a)anthracene | | 5,400 D | | 320 J | 1,600 | | 7,600 | | | | | 1,700 | | |
| Chrysene | | 5,600 D | | 370 J | 1,500 | | 9,000 | | | | | 2,100 | | |
| di-n-Octyl Phthalate | | | | | | | | | | | | 1,000 UJ | 19,000 D | |
| Benzo(b)Fluoranthene | | 4,300 D | | 520 U | 970 | | 6,100 | | | | | 1,400 | | |

Table 3-3 (continued)
Key Sample Summary

| Substance | Sediment (concentrations in ug/kg) | | | | | | | | | | | | | |
|-------------------------|------------------------------------|---------|--------|---------------------|---------------------|--------|----------|--------|--------|--------|---------------------|-----------|----------|--------|
| | ST01 | ST02 | ST03 | ST10 Back-ground | ST11 Back-ground | ST12 | ST04 | ST05 | ST06 | ST07 | ST08 Back-ground | ST09 | ST13 | ST14 |
| Benzo(k)Fluoranthene | | | | | | | 7,100 | | | | 1,200 J | | | |
| Benzo(a)Pyrene | | 4,100 D | | 520 U | 1,200 | | | 6,300 | | | | 1,700 | | |
| Benzo(g,h,i)Perylene | | 2,100 | | 520 U | 650 | | | | | | | | | |
| Delta-BHC | | | | | | | 21 JY | | | | 2.7 UJ | | | |
| Aldrin | | | | 2.7 UJ | 3.0 JY | 50 JY | | | | | | | | |
| Heptachlor Epoxide | | | | | | | | | | | 3.2 JY | | 20 JY | |
| Endosulfan I | | | | | | | 7.0 JY | | | | 2.7 UJ | | | |
| Endosulfan Sulfate | | | | | | | | 24 JY | | | 5.2 UJ | | | |
| 4,4-DDT | | | 5.2 UJ | 3.9 UJ | 23 J | | | | | | | | | |
| Gamma-chlordane | | | | | | | | | | | 12 JP | | 49 JD | |
| Aroclor-1248 | | | | | | | | | | | 280 JY | 1,400 JPD | 2,000 JD | |
| Concentrations in mg/kg | | | | | | | | | | | | | | |
| Antimony | | | | | | | | | | | 14.9 B | | 54.9 | 55.5 |
| Cadmium | | | | | | | | | 8.4 | 11.3 | 2.4 | | 34.4 | |
| Mercury | | | | | | | 0.47 N | 0.27 N | 0.34 N | 0.56 N | 0.16 UN | 0.34 N | 1.0 N | 0.39 N |
| Potassium | | | | | | | | | | | 5,400* | | 27.900 | |
| Selenium | | | | | | | | | | 1.4 B | 1.2 U | | | |
| Sodium | | | | | | | 32,300 J | | | | 1,640 U | | | |
| Thallium | 2.4 * | | | 1.9 U* | 1.5 U* | 2.2 B* | | | | | | | | |
| Zinc | | | | | | | | | | | 211 * | | 1,490 * | |
| Cyanide | | | 2.1 | 0.80 U | 0.63 U | 2.3 | | | | 6.8 | 1.1 | | | |

Table 3-3 (continued)

Key Sample Summary

| Soil (concentrations in ug/kg) | | | | | | |
|--------------------------------|---------|--------|-------|------------|------------|-----------|
| | SS01 | SS02 | SS03 | SS04 | SS05 | SS06 |
| | | | | | Background | |
| bis(2-Ethylhexyl)phthalate | | | | 130,000 BD | 1200 UJBD | 1,400 UJB |
| Delta-BHC | | | | 7.8 JPX | 2.1 U | 2.4 U |
| Gamma-BHC | | | | 6.2 JPX | 2.1 U | 2.4 U |
| Heptachlor Epoxide | | | | 12 J | 2.1 U | 2.4 U |
| Dieldrin | 7.3 J | | | 28 JPX | 4.0 U | 4.6 U |
| 4,4'-DDE | | | | 24 JP | 4.4 PX | 8.0 P |
| 4,4'-DDD | | | | 25 J | 4.6 PX | 4.6 U |
| Endosulfan Sulfate | | 6.1 JP | | | 4.0 U | 4.6 U |
| Alpha-Chlordane | 5.6 JPX | | | | 2.1 U | 2.4 U |
| Gamma-Chlordane | 5.1 JPX | | | | 2.1 U | 2.4 U |
| Aroclor-1242 | 180 J | | 490 J | | 40 U | 46 U |
| Aroclor-1254 | 140 J | 59 J | | 610 J | 40 U | 46 U |
| Concentrations in mg/kg | | | | | | |
| Barium | | | | 610 | 75.1 | 114 |
| Cadmium | | | | 24.7 | 1.2 | 2.8 |
| Selenium | | | | 3.2 S | 0.57 JB | 0.87 JB |
| Silver | | | | 5.0 | 0.94 U | 1.1 U |
| Cyanide | | | | 22.2 | 0.62 U | 0.95 |

Reporting Qualifiers

- U- Compound analyzed for, but not detected. The associated numerical value is the sample quantitation limit.
- J - Estimated value. This flag is used either when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria, but the result is less than the sample quantitation limit and greater than zero.
- P - Pesticide Aroclor target analyte where greater than 25% difference exists between the two GC columns for detected concentrations. The lower of the two values is reported and flagged with a "P."
- D- Compounds identified in an analysis at a secondary dilution factor.
- X- Other specific flags may be required to define the results properly. The "X" flags are described fully on the data tables.
- B- Reported value is less than the contract required detection limit (CRDL), but greater than or equal to the instrument detection limit (IDL).
- N- Spiked sample recovery not within control limits.
- * - Duplicate analysis not within control limits.
- S- Reported value was determined by the method of standard additions.
- Y- Detection limits raised due to interferences that precluded confident quantitation at less than the reported limit.

4.0 Characterization of Sources

4.1 Introduction

The sources at the Land and Lakes #3 site are the landfill and contaminated soil.

4.2 Landfill

4.2.1 Description

Since 1978, Land and Lakes #3 has been a landfill for solids, sludge, and liquids from municipal, industrial, and commercial operations. It accepts municipal refuse and IEPA-classified special wastes. The landfilled area occupies approximately 30 acres. Waste disposal depth is approximately 50 feet below grade, and the maximum height of the landfill is approximately 70 feet above grade.

4.2.2 Waste Characteristics

The landfill accepted oily wastes, solid wastes, liquid food waste, waste pigments, and industrial wastewater treatment sludge. Total waste quantity records and complete waste characterization data are not available. In 1980, it was estimated that the facility accepted 2,000 gallons per week of oily waste, 35,000 cubic yards per month of solid waste, and 87,500 gallons per week of food waste.

A USEPA complaint and compliance order stated that the landfill accepted 8,000 gallons of separator sludge from ARCO Petroleum, and 6,000 gallons of waste oil and water and 5,478 cubic yards of hazardous waste water treatment sludge from Environmental Dynamics. Other documentation suggests that two leather processing companies disposed of 7,540 cubic yards of tanning and finishing sludge that contained 2.1 percent by volume of chromium.

During an IEPA site inspection on April 28, 1987, 686 cubic yards of car wash sludge were sampled and the analytical results identified the following heavy metals arsenic (0.1 mg/l), barium (14 mg/l), cadmium (0.7 mg/l), chromium (2.5 mg/l), copper (15.7 mg/l), cyanide (10.0 mg/l), lead (68.5 mg/l), mercury (0.1 mg/l), nickel (3.6 mg/l), selenium (0.1 mg/l), silver (0.1 mg/l), and zinc (50 mg/l).

4.3 Contaminated Soil

4.3.1 Description

ESI key sample analyses indicate that an approximately 30-acre area of contaminated soil is present onsite. This area is defined as the area encompassed by the ESI key onsite soil samples SS01, SS02, SS03, and SS04.

4.3.2 Waste Characteristics

ESI analytical results indicate the area of affected soil contains releases of one semivolatile organic, nine pesticides, two polychlorinated biphenyls (PCBs), and five inorganic analytes. Concentrations of organic compounds ranged from 5.1 to 130,000 $\mu\text{g}/\text{kg}$, and concentrations of inorganic analytes ranged from 3.2 to 610 mg/kg.

5.0 Discussion of Migration Pathways

5.1 Introduction

This section includes information useful in analyzing the potential impact of contaminants found at the Land and Lakes #3 site on the four migration pathways: groundwater, surface water, air, and soil.

5.2 Groundwater

Four shallow onsite monitoring wells, screened in glacial drift, were sampled during the ESI.

Glacial drift, consisting of low-permeability lacustrine silts and clays with some sand and gravel lenses, extends to a depth of approximately 80 feet below land surface. The water table is likely to be encountered at depths ranging from 5 to 10 feet below land surface within the glacial drift. The glacial drift has little potential as an aquifer because it lacks production capability (IEPA 1989).

Onsite, the glacial drift groundwater reportedly flows radially outward. The height and slope of the landfilled site area is the likely cause of this onsite gradient. Offsite, the gradient of the glacial drift groundwater has not been determined.

Silurian dolomite bedrock lies beneath the glacial drift and has a thickness of approximately 400 feet. The Silurian dolomite aquifer is productive; however, it has only industrial and minimal drinking water use near the site. Beneath the Silurian dolomite is the Maquoketa Shale, approximately 400 feet thick. The relatively impermeable Maquoketa lies above sandstone aquifers, which are used for industrial supply near the site (Illinois State Water Survey [ISWS] 1993).

Nearly all of the population within 4 miles of the site is supplied by treated water from Lake Michigan (USGS 1991). However, the potential exists for hazardous substances to migrate from the site to groundwater in the glacial drift aquifer. No glacial drift wells and few Silurian dolomite wells supply drinking water within 4 miles of the site, (ISWS 1993). The Silurian dolomite drinking water wells consist of hand-pump wells in public parks and a few private wells. No sandstone aquifer wells supply drinking water within 4 miles of the site. Table 5-1 summarizes the approximate drinking water population within 4 miles of the site (ISWS 1993).

Lake Calumet, the Little Calumet River, and the Calumet Sag Channel, which comprise the 15-mile downstream surface water segment, are potential fisheries. Portions of Deadstick Pond and an adjoining ditch are characterized as Palustrine emergent wetlands (U.S. Department of the Interior 1984). Portions of Deadstick Pond and an adjoining ditch are characterized as Palustrine emergent wetlands (U.S. Department of the Interior 1984).

Site runoff flows into Lake Calumet and Deadstick Pond. Glacial drift groundwater may also discharge to these surface water bodies. Potential site contaminants may enter the surface water pathway through culverts discharging into Lake Calumet and Deadstick Pond. Surface water runoff sampling in Lake Calumet River approximately 2 miles downstream of the site. The Little Calumet River flows into the Calumet Sag Channel about 9 miles downstream of the site, and the channel flows more than 15 miles downstream of the site (USGS 1980). No surface water outlet from Deadstick Pond was observed; therefore, surface water is not expected to migrate outside of the pond perimeter by overland flow. The site is located outside the 500-year floodplain (Federal Emergency Management Agency 1983).

5.3 Surface Water

The glacial drift aquifer may discharge to Lake Calumet and Deadstick Pond; therefore, hazardous substances potentially present in the glacial drift aquifer may be migrating to the river and wetlands. Surface water and sediment sampling in Lake Calumet and the wetlands address this threat to the surface water pathway.

| Private Well Users Within Four Miles of the Land and Lakes Site | Radial Distance from Site (in miles) | Approximate Population Supplied by Private Wells | Total Population |
|---|--------------------------------------|--|------------------|
| 0 to 1/4 | 0 | 0 | 37 |
| 1/4 to 1/2 | 0 | 0 | 0 |
| 1/2 to 1 | 0 | 0 | 0 |
| 1 to 2 | 0 | 0 | 0 |
| 2 to 3 | 21 | 21 | 0 |
| 3 to 4 | 16 | 16 | 0 |

ESI key sediment samples indicate that hazardous substances are present in sediment in Lake Calumet, Deadstick Pond, and Deadstick Pond's adjoining wetland at concentrations significantly above background. In Lake Calumet, key samples ST03 and ST12 document release of two volatile organic compounds, two semivolatile organic compounds, two pesticides, and two inorganic analytes; with organic concentrations ranging from 23 to 2,100 ppb, and inorganic concentrations ranged from 2.1 to 2.3 ppm. Deadstick Pond key samples ST06 and ST13 document release of one semivolatile organic compound, two pesticides, one PCB, and five inorganic analytes, with organic concentrations ranging from 20 to 8,800 ppb and inorganic concentrations ranging from 0.34 to 27,900 ppm. Key samples ST09 and ST14, collected from the wetland adjoining Deadstick Pond, document release of two volatile organics, one semivolatile organic compound, one PCB, and two inorganic analytes. In ST09 and ST14, organic concentrations ranged from 100 to 19,000 ppb, and inorganic concentrations ranged from 0.34 to 55.5 ppm.

5.4 Air

No documented releases to the air pathway have been attributed to the site. During ESI field activities, no air sampling was conducted. Air monitoring with a photoionization detector during sampling showed no readings above background.

Sensitive environments located within 4 miles of the site may be affected by particulate migration of hazardous substances from the site. The site is located within the Lake Calumet Natural Area, a habitat for threatened and endangered species that encompasses approximately 5 square miles near Lake Calumet. Six threatened and endangered animals reside within the Lake Calumet Natural Area. (Illinois Department of Conservation 1993).

5.5 Soil

Key soil samples indicate that approximately 30 acres of soil contain an observed release. Approximately 10 workers are potentially threatened by soil exposure. Potential trespassers may directly contact contaminated onsite soils because the site is not completely fenced. Onsite soils are unlikely to affect residential areas, because few residences are near the site; the nearest residential area is located about 1 mile southeast of the site. An estimated 274 people reside within 1 mile of the site, based on apportionment of surrounding municipalities and counting of houses (US Department of Commerce 1990, USGS 1991).

6.0 References

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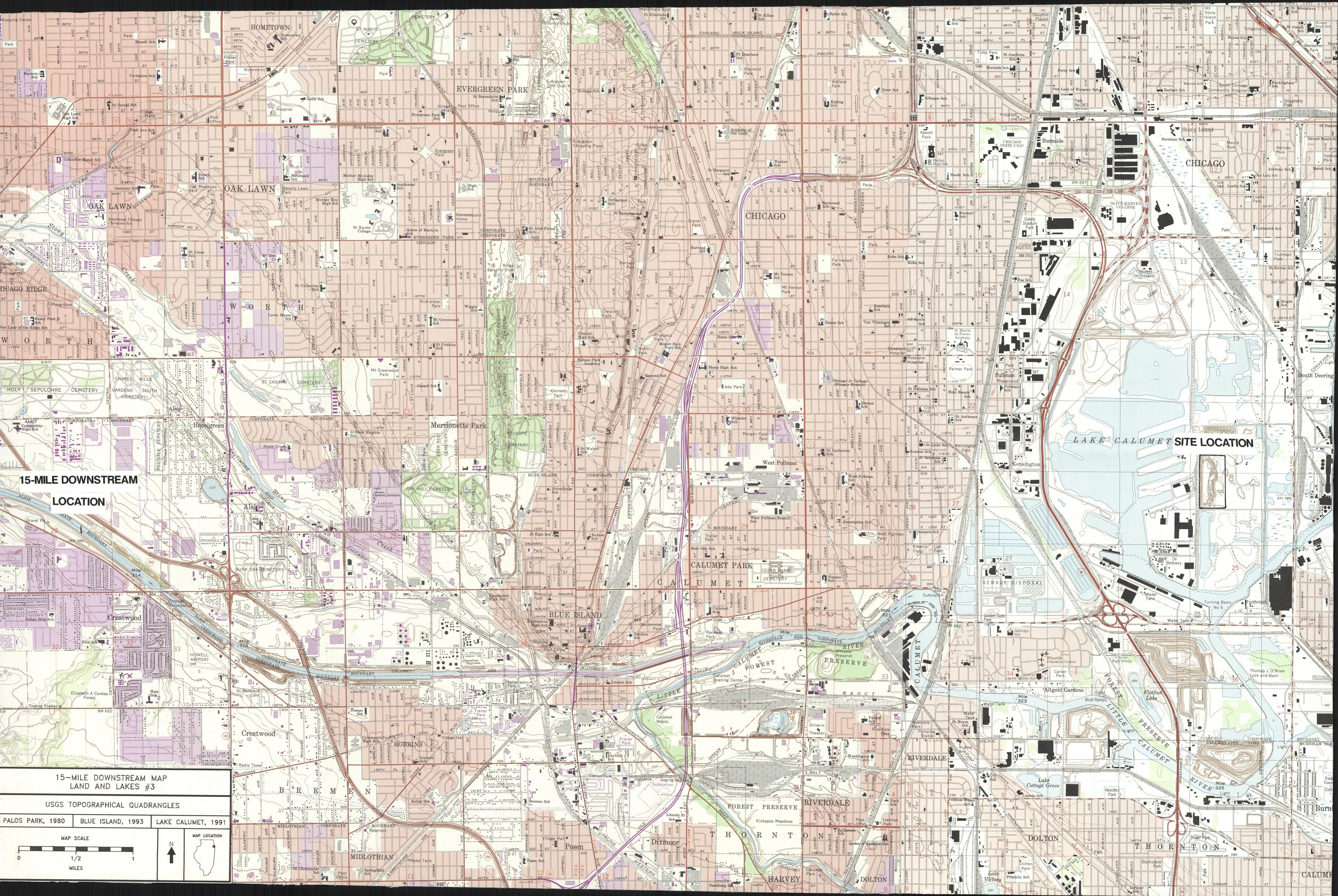
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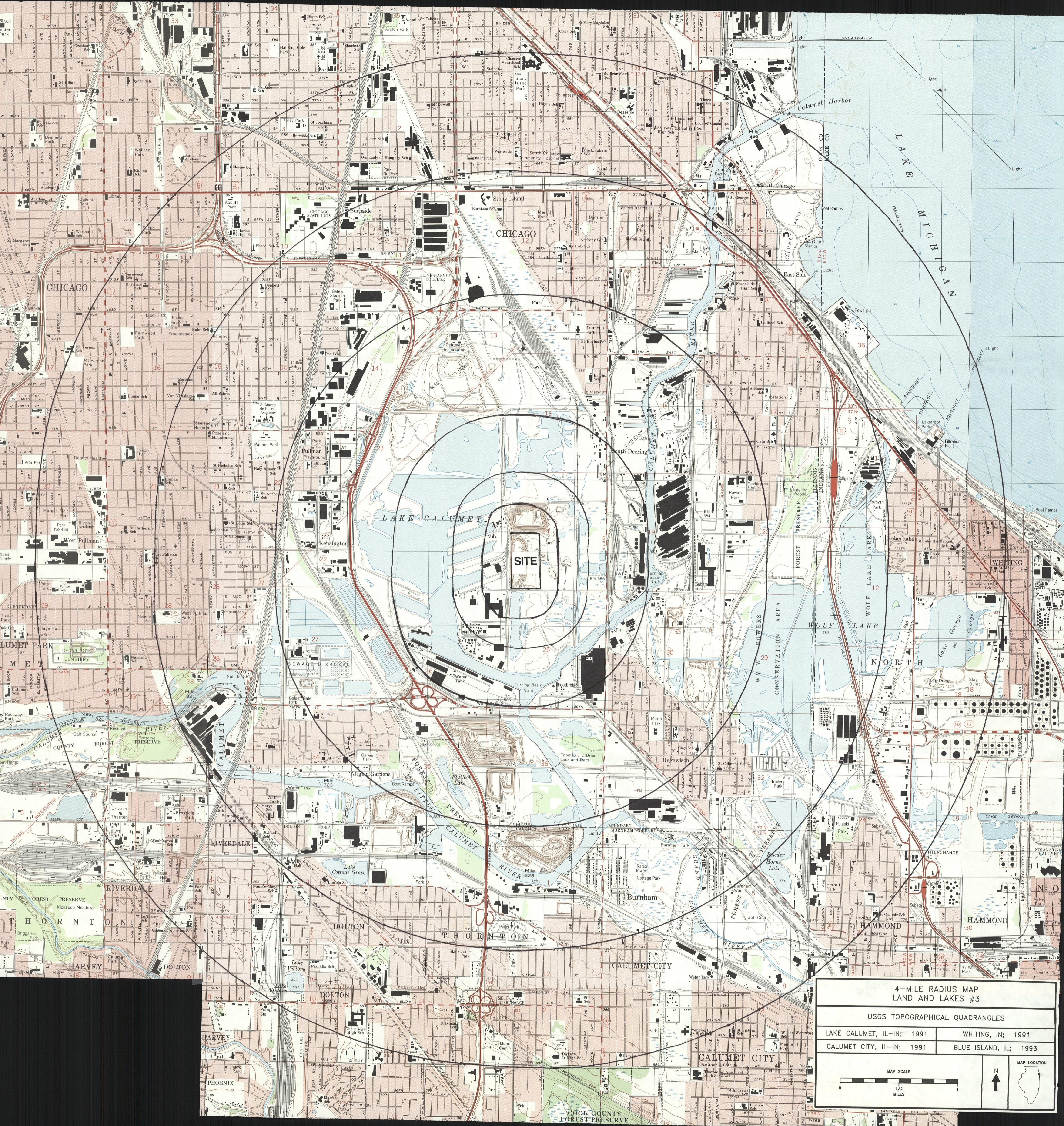
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Appendix A
Land and Lakes #3
Site 4-Mile Radius Map
and
15-Mile Surface Water Route Map





Appendix B

Land and Lakes #3

Target Compound List and
Target Analyte List

Target Compound List

Volatiles

| | |
|----------------------------|---------------------------|
| Chloromethane | 1,2-Dichloropropane |
| Bromomethane | Cis-1,3-Dichloropropene |
| Vinyl Chloride | Trichloroethene |
| Chloroethane | Dibromochloromethane |
| Methylene Chloride | 1,1,2-Trichloroethane |
| Acetone | Benzene |
| Carbon Disulfide | trans-1,3-Dichloropropane |
| 1,1-Dichloroethene | Bromoform |
| 1,1-Dichloroethane | 4-Methyl-2-pentanone |
| 1,2-Dichloroethene (total) | 2-Hexanone |
| Chloroform | Tetrachloroethene |
| 1,2-Dichloroethane | Toluene |
| 2-Butanone | 1,1,2,2-Tetrachloroethane |
| 1,1,1-Trichloroethane | Chlorobenzene |
| Carbon Tetrachloride | Ethyl benzene |
| Bromodichloromethane | Styrene |
| | Xylenes (total) |

Source: Target Compound List for water and soil with low or medium levels of volatile and semivolatile organic contaminants, as shown in the Quality Assurance Project Plan for Region V Superfund Site Assessment Program, September 27, 1991.

Target Compound List (Continued)

Semivolatiles

| | |
|-------------------------------|-----------------------------|
| Phenol | Acenaphthene |
| bis(2-Chloroethyl) ether | 2,4-Dinitrophenol |
| 2-Chlorophenol | 4-Nitrophenol |
| 1,3-Dichlorobenzene | Dibenzofuran |
| 1,4-Dichlorobenzene | 2,4-Dinitrotoluene |
| 1,2-Dichlorobenzene | Diethylphthalate |
| 2-Methylphenol | 4-Chlorophenyl-phenyl ether |
| 2,2-oxybis-(1-Chloropropane)* | Fluorene |
| 4-Methylphenol | 4-Nitroaniline |
| N-Nitroso-di-n-dipropylamine | 4,6-Dinitro-2-methylphenol |
| Hexachloroethane | N-Nitrosodiphenylamine |
| Nitrobenzene | 4-Bromophenyl-phenyl ether |
| Isophorone | Hexachlorobenzene |
| 2-Nitrophenol | Pentachlorophenol |
| 2,4-Dimethylphenol | Phenanthrene |
| bis(2-Chloroethoxy) methane | Anthracene |
| 2,4-Dichlorophenol | Carbazole |
| 1,2,4-Trichlorobenzene | Di-n-butylphthalate |
| Naphthalene | Fluoranthene |
| 4-Chloroaniline | Pyrene |
| Hexachlorobutadiene | Butyl benzyl phthalate |
| 4-Chloro-3-methylhenol | 3,3-Dichlorbenzidine |
| 2-Methylnaphthalene | Benzo(a)anthracene |
| Hexachlorocyclopentadiene | Chrysene |
| 2,4,6-Trichlorophenol | bis(2-Ethylhexyl)phthalate |
| 2,4,5-Trichlorophenol | Di-n-Octyphthalate |
| 2-Chloronephthalene | Benzo(b)fluoranthene |
| 2-Nitroaniline | Benzo(k)fluoranthene |
| Dimethylphthalate | Benzo(a)pyrene |
| Acenaphthylene | Indeno(1,2,3-cd)pyrene |
| 2,6-Dinitrotoluene | Dibenzo(a,h)anthracene |
| 3-Nitroaniline | Benzo(g,h,i)perylene |

*Previously known by the name of bis(2-chlorousipropyl) ether.

Source: Target Compound List for water and soil with low or medium levels of volatile and semivolatile organic contaminants, as shown in the Quality Assurance Project Plan for Region V Superfund Site Assessment Program, September 27, 1991.

Target Compound List (Continued)

Pesticide/PCB

| | |
|---------------------|-----------------|
| alpha-BHC | 4,4-DDT |
| beta-BHC | Methoxychlor |
| delta-BHC | Endrin ketone |
| gamma-BHC (Lindane) | Endrin aldehyde |
| Heptachlor | alpha-chlordane |
| Aldrin | gamma-chlordane |
| Heptachlor epoxide | Toxaphene |
| Endosulfan I | Aroclor-1016 |
| Dieldrin | Aroclor-1221 |
| 4,4-DDE | Aroclor-1232 |
| Endrin | Aroclor-1242 |
| Endosulfan II | Aroclor-1248 |
| 4,4-DDD | Aroclor-1254 |
| Endosulfan sulfate | Aroclor-1260 |

Source: Target Compound List for water and soil containing less than high concentrations of pesticides/aroclors, as shown in the Quality Assurance Project Plan for Region V Superfund Site Assessment Program, September 27, 1991.

Target Analyte List

| | |
|-----------|-----------|
| Aluminum | Magnesium |
| Antimony | Manganese |
| Arsenic | Mercury |
| Barium | Nickel |
| Beryllium | Potassium |
| Cadmium | Selenium |
| Calcium | Silver |
| Chromium | Sodium |
| Cobalt | Thallium |
| Copper | Vanadium |
| Iron | Zinc |
| Lead | Cyanide |

Source: Target Analyte List in the Quality Assurance Project Plan for Region V Superfund Site Assessment Program, September 27, 1991.

Appendix C

Land and Lakes #3

Analytical Results

Appendix C

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Data Reporting Qualifiers

Definitions for Organic Chemical Data Qualifiers

- R - Indicates that the data are unusable. The compound may or may not be present.
- U - Indicates compound was analyzed for but not detected. The associated numerical value is the sample quantitation limit.
- J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero.
- N - Indicates presumptive evidence of a compound. This flag is only used for TICs where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, the N code is not used.
- P - This flag is used for a pesticide Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported and flagged with a "P".
- C - This flag applies to results where identification has been confirmed by GC/MS.
- B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag must be used for a TIC as well as for a positively identified TCL compound
- E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for the specific analysis. This flag will not apply to pesticide/PCBs analyzed by GC/MS methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and re-analyzed according to the specifications.
- D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- A - This flag indicates that a TIC is a suspected aldol-condensation product.

- X - Other specific flags may be required to properly define the results. The "X" flags are fully described on the data tables.

Definitions for Inorganic Chemical Data Qualifiers

- R - Indicates that the data are unusable. The compound may or may not be present.
- U - Indicates compound was analyzed for but not detected. The associated numerical value is the sample quantitation limit.
- J - Indicates an estimated value.
- B - Indicates that the reported value is less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL).
- E - The reported value is estimated because of the presence of interference.
- M - Duplicate injection precision criteria not met.
- N - Spiked sample recovery not within control limits.
- S - The reported value was determined by the Method of Standard Additions (MSA).
- W - Post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- * - Duplicate analysis was not within control limits.
- + - Correlation coefficient for the MSA was less than 0.995.

| Volatile Organic Analysis for Groundwater Samples Land & Lakes #3 | | | | |
|--|---|--------|-------|-------|
| Volatile Compound | Sample Locations and Number Concentrations in ug/l. | | | |
| | GW01 | GW04 | GW14 | GW16 |
| Chloromethane | 10 U | 21 Y | 10 U | 10 U |
| Bromomethane | 10 U | 10 U | 10 U | 10 U |
| Vinyl Chloride | 10 U | 34 | 10 U | 10 U |
| Chloroethane | 10 U | 40 | 10 U | 10 U |
| Methylene Chloride | 10 U | 11 | 10 U | 10 U |
| Acetone | 10 UJ | 10 UJ | 26 J | 10 UJ |
| Carbon Disulfide | 10 U | 41 | 10 U | 10 U |
| 1,1-Dichloroethene | 10 U | 10 U | 10 U | 10 U |
| 1,1-Dichloroethane | 10 U | 11 | 10 U | 10 U |
| 1,2-Dichloroethene (total) | 10 U | 8 J | 10 U | 10 U |
| Chloroform | 10 U | 10 U | 10 U | 10 U |
| 1,2-Dichloroethane | 10 U | 10 U | 10 U | 10 U |
| 2-Butanone | 10 UJ | 150 | 10 UJ | 10 UJ |
| 1,1,1-Trichloroethane | 10 U | 10 U | 10 U | 10 U |
| Carbon Tetrachloride | 10 U | 10 U | 10 U | 10 U |
| Bromodichloromethane | 10 U | 10 U | 10 U | 10 U |
| 1,2-Dichloropropane | 10 U | 10 U | 10 U | 10 U |
| cis-1,3-Dichloropropene | 10 U | 10 U | 10 U | 10 U |
| Trichloroethene | 10 U | 21 | 10 U | 10 U |
| Dibromochloromethane | 10 U | 10 U | 10 U | 10 U |
| 1,1,2-Trichloroethane | 10 U | 10 U | 10 U | 10 U |
| Benzene | 190 | 1100 D | 10 U | 10 U |
| trans-1,3-Dichloropropene | 10 U | 10 U | 10 U | 10 U |
| Bromoform | 10 U | 10 U | 10 U | 10 U |
| 4-Methyl-2-Pentanone | 10 U | 34 | 10 U | 10 U |
| 2-Hexanone | 10 U | 10 U | 10 U | 10 U |
| Tetrachloroethene | 10 U | 6 J | 10 U | 10 U |
| 1,1,2,2-Tetrachloroethane | 10 U | 10 U | 10 U | 10 U |
| Toluene | 24 | 4000 D | 10 U | 10 U |
| Chlorobenzene | 10 U | 10 U | 10 U | 10 U |
| Ethylbenzene | 140 | 49 | 10 U | 10 U |
| Styrene | 10 U | 10 U | 10 U | 10 U |
| Xylene (total) | 470 D | 180 | 10 U | 10 U |
| Total Number of TICs * | 10 | 10 | 0 | 0 |

* Number, not concentrations, of tentatively identified compounds (TICs).

gw-vola

| Volatile Organic Analysis for Groundwater Samples Tentatively Identified Compounds Land & Lakes #3 Concentrations in ug/L | | |
|--|----------------|-------------------------|
| Compound Name | Retention Time | Estimated Concentration |
| Sample GW01 | | |
| Unknown (BP M/E 59) | 5.08 | 38 J |
| Unknown (BP M/E 75) | 6.63 | 43 J |
| Tetrahydrofuran | 8.65 | 130 JN |
| Alkylbenzene Isomer (BP M/E | 17.28 | 50 J |
| Trimethylbenzene Isomer (BP | 17.38 | 32 J |
| Alkylbenzene Isomer (BP M/E | 17.87 | 23 J |
| Trimethylbenzene Isomer (BP | 18.12 | 130 J |
| Alkylbenzene Isomer (BP M/E | 18.65 | 25 J |
| Trimethylbenzene Isomer (BP | 18.98 | 55 J |
| C10.H16.O Isomer (BP M/E 81) | 20.60 | 33 J |
| Sample GW04 | | |
| C4.H8 Isomer (BP M/E 41) | 3.75 | 57 J |
| C3.H10.N2 Isomer (BP M/E 59) | 5.08 | 670 J |
| 2-Chloropropane | 5.27 | 57 JN |
| 2-Ethoxypropane | 6.12 | 130 JN |
| C6.H12 Isomer (BP M/E 56) | 7.85 | 150 J |
| Unknown (BP M/E 45) | 8.38 | 120 J |
| Unknown (BP M/E 43) | 8.65 | 100 J |
| Cyclohexane | 8.95 | 390 JN |
| Methylcyclohexane | 10.52 | 550 JN |
| 3,3-Dimethyl-2-Hexanone | 15.97 | 46 JN |

vtic-gw

| Semivolatile Organic Analysis for Groundwater Samples Land & Lakes #3 | | | | |
|--|----------------------------|------|------|------|
| Semivolatile Compound | Sample Location and Number | | | |
| | Concentrations in ug/L | | | |
| | GW01 | GW04 | GW14 | GW16 |
| Phenol | 10 U | 16 U | 32 U | 10 U |
| bis(2-Chloroethyl)Ether | 10 U | 10 U | 10 U | 10 U |
| 2-Chlorophenol | 10 U | 10 U | 10 U | 10 U |
| 1,3-Dichlorobenzene | 10 U | 10 U | 10 U | 10 U |
| 1,4-Dichlorobenzene | 10 U | 10 U | 10 U | 10 U |
| 1,2-Dichlorobenzene | 10 U | 10 U | 10 U | 10 U |
| 2-Methylphenol | 10 U | 14 | 10 U | 10 U |
| 2,2'-oxybis(1-Chloropropane) | 10 U | 10 U | 10 U | 10 U |
| 4-Methylphenol | 10 U | 21 | 10 U | 10 U |
| n-Nitroso-Di-n-Propylamine | 10 U | 10 U | 10 U | 10 U |
| Hexachloroethane | 10 U | 10 U | 10 U | 10 U |
| Nitrobenzene | 10 U | 10 U | 10 U | 10 U |
| Isophorone | 10 U | 10 U | 10 U | 10 U |
| 2-Nitrophenol | 10 U | 10 U | 10 U | 10 U |
| 2,4-Dimethylphenol | 14 | 20 | 10 U | 10 U |
| bis(2-Chloroethoxy)Methane | 10 U | 10 U | 10 U | 10 U |
| 2,4-Dichlorophenol | 10 U | 10 U | 10 U | 10 U |
| 1,2,4-Trichlorobenzene | 10 U | 10 U | 10 U | 10 U |
| Naphthalene | 10 | 32 | 10 U | 10 U |
| 4-Chloroaniline | 10 U | 10 U | 10 U | 10 U |
| Hexachlorobutadiene | 10 U | 10 U | 10 U | 10 U |
| 4-Chloro-3-Methylphenol | 10 U | 10 U | 10 U | 10 U |
| 2-Methylnaphthalene | 10 U | 5 U | 10 U | 10 U |
| Hexachlorocyclopentadiene | 10 U | 10 U | 10 U | 10 U |
| 2,4,6-Trichlorophenol | 10 U | 10 U | 10 U | 10 U |
| 2,4,5-Trichlorophenol | 25 U | 25 U | 25 U | 25 U |
| 2-Chloronaphthalene | 10 U | 10 U | 10 U | 10 U |
| 2-Nitroaniline | 25 U | 25 U | 25 U | 25 U |
| Dimethyl Phthalate | 10 U | 10 U | 10 U | 10 U |
| Acenaphthylene | 10 U | 10 U | 10 U | 10 U |
| 2,6-Dinitrotoluene | 10 U | 10 U | 10 U | 10 U |
| 3-Nitroaniline | 25 U | 25 U | 25 U | 25 U |
| Acenaphthene | 10 U | 10 U | 10 U | 10 U |
| 2,4-Dinitrophenol | 25 U | 25 U | 25 U | 25 U |
| 4-Nitrophenol | 25 U | 25 U | 25 U | 25 U |
| Dibenzofuran | 10 U | 10 U | 10 U | 10 U |
| 2,4-Dinitrotoluene | 10 U | 10 U | 10 U | 10 U |
| Diethylphthalate | 10 U | 10 U | 10 U | 10 U |
| 4-Chlorophenyl-phenylether | 10 U | 10 U | 10 U | 10 U |
| Fluorene | 10 U | 10 U | 10 U | 10 U |

Semivolatile Organic Analysis for Groundwater Samples (Continued)
Land & Lakes #3

| Semivolatile Compound | Sample Location and Number Concentrations in ug/L | | | |
|----------------------------|---|-------|-------|-------|
| | GW01 | GW04 | GW14 | GW16 |
| 4-Nitroaniline | 25 U | 25 U | 25 U | 25 U |
| 4,6-Dinitro-2-Methylphenol | 25 U | 25 U | 25 U | 25 U |
| n-Nitrosodiphenylamine | 10 U | 10 U | 10 U | 10 U |
| 4-Bromophenyl-phenylether | 10 U | 10 U | 10 U | 10 U |
| Hexachlorobenzene | 10 U | 10 U | 10 U | 10 U |
| Pentachlorophenol | 25 UJ | 25 UJ | 25 UJ | 25 UJ |
| Phenanthrene | 10 U | 10 U | 10 U | 10 U |
| Anthracene | 10 U | 10 U | 10 U | 10 U |
| Carbazole | 10 U | 10 U | 10 U | 10 U |
| di-n-Butylphthalate | 10 U | 10 U | 10 U | 10 U |
| Fluoranthene | 10 U | 10 U | 10 U | 10 U |
| Pyrene | 10 UJ | 10 UJ | 10 U | 10 UJ |
| Butylbenzylphthalate | 10 U | 10 U | 10 U | 10 U |
| 3,3'-Dichlorobenzidine | 10 U | 10 U | 10 U | 10 U |
| Benzo(a)Anthracene | 10 U | 10 U | 10 U | 10 U |
| Chrysene | 10 U | 10 U | 10 U | 10 U |
| bis(2-Ethylhexyl)Phthalate | 10 U | 20 | 10 U | 10 U |
| di-n-Octyl Phthalate | 10 U | 10 U | 10 U | 10 U |
| Benzo(b)Fluoranthene | 10 U | 10 U | 10 U | 10 U |
| Benzo(k)Fluoranthene | 10 U | 10 U | 10 U | 10 U |
| Benzo(a)Pyrene | 10 U | 10 U | 10 U | 10 U |
| Indeno(1,2,3-cd)Pyrene | 10 U | 10 U | 10 U | 10 U |
| Dibenzo(a,h)Anthracene | 10 U | 10 U | 10 U | 10 U |
| Benzo(g,h,i)Perylene | 10 U | 10 U | 10 U | 10 U |
| Total Number of TICs * | 20 | 20 | 18 | 20 |

* Number, not concentration, of tentatively identified compounds (TICs).

gw-semiv

Semivolatile Organic Analysis for Groundwater Samples

Tentatively Identified Compounds

Land & Lakes #3

Concentrations in ug/L

| Compound Name | Retention Time | Estimated Concentration |
|-------------------------------|----------------|-------------------------|
| Sample GW01 | | |
| Trimethylbenzene Isomer (BP) | 7.05 | 38 J |
| C10.H16.O Isomer (BP M/E 81) | 9.38 | 43 J |
| Bicyclo[2.2.1]Heptan-2-One, | 10.67 | 120 JN |
| Unknown (BP M/E 57) | 10.85 | 94 J |
| Unknown (BP M/E 55) | 11.95 | 43 J |
| Unknown (BP M/E 59) | 12.52 | 98 J |
| Unknown (BP M/E 41) | 12.93 | 45 J |
| Unknown (BP M/E 59) | 13.73 | 270 J |
| Unknown (BP M/E 59) | 13.82 | 120 J |
| Unknown (BP M/E 59) | 13.98 | 30 J |
| Unknown (BP M/E 57) | 15.65 | 110 J |
| Unknown (BP M/E 45) | 16.03 | 29 J |
| Unknown (BP M/E 43) | 16.15 | 28 J |
| Unknown (BP M/E 45) | 17.03 | 48 J |
| Unknown (BP M/E 59) | 17.70 | 160 J |
| Unknown (BP M/E 41) | 20.28 | 55 J |
| 1-Naphthalenecarboxylic Acid | 20.40 | 64 JN |
| C11.H8.O2 Isomer Coelute (BP) | 20.60 | 23 J |
| Unknown (BP M/E 91) | 21.47 | 26 J |
| 9,10-Anthracenedione | 26.80 | 46 JN |
| Sample GW04 | | |
| Unknown (BP M/E 43) | 4.75 | 31 J |
| Unknown (BP M/E 45) | 10.65 | 43 J |
| Unknown (BP M/E 105) | 12.27 | 78 J |
| Unknown (BP M/E 269) | 13.55 | 21 J |
| C10.H14.O Isomer (BP M/E 135) | 13.68 | 42 J |
| Unknown (BP M/E 104) | 13.85 | 17 J |
| Unknown (BP M/E 43) | 15.00 | 40 J |
| Unknown (BP M/E 57) | 15.37 | 11 J |
| Unknown (BP M/E 43) | 16.17 | 55 J |
| Unknown (BP M/E 45) | 16.78 | 15 J |
| Unknown (BP M/E 163) | 17.47 | 21 J |
| Unknown (BP M/E 43) | 18.30 | 71 J |
| Unknown (BP M/E 135) | 18.42 | 9 J |
| Unknown (BP M/E 91) | 19.50 | 26 J |
| Unknown (BP M/E 151) | 20.05 | 24 J |
| Unknown (BP M/E 43) | 20.67 | 14 J |
| Unknown (BP M/E 64) | 21.37 | 47 J |
| Unknown (BP M/E 160) | 21.53 | 23 J |
| Sulfur, Mol. (S8) | 24.82 | 670 JN |
| Benzenesulfonamide, N-Cycloh | 25.92 | 35 JN |

Semivolatile Organic Analysis for Groundwater Samples (Continued)

Tentatively Identified Compounds

Land & Lakes #3

Concentrations in ug/L

| Compound Name | Retention Time | Estimated Concentration |
|------------------------------|----------------|-------------------------|
| Sample GW14 | | |
| Unknown (BP M/E 74) | 4.50 | 17 J |
| Unknown (BP M/E 60) | 4.87 | 4 J |
| Unknown (BP M/E 60) | 7.33 | 3 J |
| Unknown (BP M/E 105) | 11.98 | 6 J |
| Unknown (BP M/E 55) | 13.00 | 61 J |
| Unknown (BP M/E 91) | 13.30 | 26 J |
| Unknown (BP M/E 55) | 13.42 | 5 J |
| Unknown (BP M/E 121) | 15.02 | 2 J |
| Benzaldehyde Isomer (BP M/E | 15.33 | 4 J |
| C9.H10.O3 Isomer (BP M/E 151 | 16.77 | 2 J |
| Unknown (BP M/E 64) | 16.98 | 2 J |
| Unknown (BP M/E 57) | 17.27 | 2 J |
| Unknown (BP M/E 43) | 18.17 | 4 J |
| Unknown (BP M/E 182) | 19.42 | 4 J |
| Unknown (BP M/E 198) | 21.80 | 2 J |
| 1H,3H-Naphtho[1,8-CD]Pyran-1 | 24.32 | 2 JN |
| Sulfur, Mol. (S8) | 24.52 | 10 JN |
| Unknown (BP M/E 41) | 27.43 | 3 J |
| Sample GW14 Duplicate | | |
| Unknown (BP M/E 74) | 4.65 | 15 J |
| Unknown (BP M/E 60) | 5.05 | 3 J |
| 2,5-Furandione, 3-Ethyl-4-Me | 9.58 | 2 JN |
| Unknown (BP M/E 105) | 12.27 | 3 J |
| Hexanoic Acid, 6-Amino- | 13.22 | 82 JN |
| Unknown (BP M/E 91) | 13.37 | 9 J |
| Unknown (BP M/E 55) | 13.48 | 4 J |
| Unknown (BP M/E 60) | 13.58 | 2 J |
| Benzaldehyde Isomer (BP M/E | 15.35 | 3 J |
| C9.H10.O3 Isomer (BP M/E 151 | 16.78 | 2 J |
| Unknown (BP M/E 43) | 18.20 | 4 J |
| Unknown (BP M/E 182) | 19.43 | 3 J |
| Unknown (BP M/E 43) | 23.72 | 2 J |
| 1H,3H-Naphtho[1,8-CD]Pyran-1 | 24.33 | 2 JN |
| Sulfur, Mol. (S8) | 24.53 | 11 JN |
| Unknown (BP M/E 114) | 27.48 | 5 J |
| Unknown (BP M/E 41) | 30.75 | 3 J |
| Unknown (BP M/E 114) | 37.60 | 5 J |

Semivolatile Organic Analysis for Groundwater Samples (Continued)

Tentatively Identified Compounds

Land & Lakes #3

Concentrations in ug/L

| Compound Name | Retention Time | Estimated Concentration |
|-----------------------------|----------------|-------------------------|
| Sample GW16 | | |
| Unknown (BP M/E 55) | 13.08 | 53 J |
| Unknown (BP M/E 58) | 13.88 | 36 J |
| Unknown (BP M/E 64) | 17.02 | 6 J |
| Unknown (BP M/E 57) | 17.18 | 4 J |
| Unknown (BP M/E 45) | 19.60 | 11 J |
| Unknown (BP M/E 112) | 20.87 | 7 J |
| Unknown (BP M/E 57) | 21.18 | 4 J |
| Unknown (BP M/E 64) | 21.23 | 10 J |
| Unknown (BP M/E 144) | 22.70 | 4 J |
| Sulfur, Mol. (S8) | 24.68 | 270 JN |
| Unknown (BP M/E 55) | 24.85 | 4 J |
| C13.H10.O.N2 Isomer (BP M/E | 25.47 | 6 J |
| Unknown (BP M/E 114) | 27.35 | 4 J |
| Unknown (BP M/E 43) | 29.25 | 21 J |
| Unknown (BP M/E 43) | 30.73 | 7 J |
| Unknown (BP M/E 43) | 31.17 | 5 J |
| Unknown (BP M/E 43) | 31.32 | 20 J |
| Unknown (BP M/E 308) | 31.78 | 8 J |
| Unknown (BP M/E 43) | 33.33 | 4 J |
| Unknown (BP M/E 43) | 35.75 | 5 J |

rtic-gw

| Pesticide/PCB Analysis for Groundwater Samples Land & Lakes #3 | | | | |
|---|---|----------|----------|---------|
| Pesticide/ PCB | Sample Locations and Number Concentrations in ug/L | | | |
| | GW01 | GW04 | GW14 | GW16 |
| Alpha-BHC | 0.050 UJ | 0.050 UJ | 0.050 UJ | 0.050 U |
| Beta-BHC | 0.050 UJ | 0.050 UJ | 0.050 UJ | 0.050 U |
| Delta-BHC | 0.072 JP | 0.050 UJ | 0.15 JY | 0.050 U |
| Gamma-BHC (Lindane) | 0.050 UJ | 0.050 UJ | 0.050 UJ | 0.050 U |
| Heptachlor | 0.050 UJ | 0.050 UJ | 0.050 UJ | 0.050 U |
| Aldrin | 0.031 JP | 0.050 UJ | 0.050 UJ | 0.050 U |
| Heptachlor Epoxide | 0.050 UJ | 0.050 UJ | 0.050 UJ | 0.050 U |
| Endosulfan I | 0.050 UJ | 0.050 UJ | 0.050 UJ | 0.050 U |
| Dieldrin | 0.10 UJ | 0.10 UJ | 0.10 UJ | 0.10 U |
| 4,4'-DDE | 0.10 UJ | 0.10 UJ | 0.10 UJ | 0.10 U |
| Endrin | 0.10 UJ | 0.10 UJ | 0.10 UJ | 0.10 U |
| Endosulfan II | 0.10 UJ | 0.10 UJ | 0.10 UJ | 0.10 U |
| 4,4'-DDD | 0.10 UJ | 0.10 UJ | 0.10 UJ | 0.10 U |
| Endosulfan Sulfate | 0.10 UJ | 0.10 UJ | 0.10 UJ | 0.10 U |
| 4,4'-DDT | 0.10 UJ | 0.10 UJ | 0.10 UJ | 0.10 U |
| Methoxychlor | 0.50 UJ | 0.50 UJ | 0.50 UJ | 0.50 U |
| Endrin Ketone | 0.10 UJ | 0.10 UJ | 0.10 UJ | 0.10 U |
| Endrin Aldehyde | 0.10 UJ | 0.10 UJ | 0.10 UJ | 0.10 U |
| Alpha-Chlordane | 0.050 UJ | 0.050 UJ | 0.050 UJ | 0.050 U |
| Gamma-Chlordane | 0.050 UJ | 0.050 UJ | 0.050 UJ | 0.050 U |
| Toxaphene | 5.0 UJ | 5.0 UJ | 5.0 UJ | 5.0 U |
| Aroclor-1016 | 1.0 UJ | 1.0 UJ | 1.0 UJ | 1.0 U |
| Aroclor-1221 | 2.0 UJ | 2.0 UJ | 2.0 UJ | 2.0 U |
| Aroclor-1232 | 1.0 UJ | 1.0 UJ | 1.0 UJ | 1.0 U |
| Aroclor-1242 | 1.0 UJ | 1.0 UJ | 1.0 UJ | 1.0 U |
| Aroclor-1248 | 1.0 UJ | 1.0 UJ | 1.0 UJ | 1.0 U |
| Aroclor-1254 | 1.0 UJ | 0.80 J | 1.0 UJ | 1.0 U |
| Aroclor-1260 | 1.0 UJ | 1.0 UJ | 1.0 UJ | 1.0 U |

gwpest

Inorganic Analysis for Groundwater Samples
Land & Lakes #3

| Metals and Cyanide | Sample Locations and Number Concentrations in ug/L | | | |
|--------------------------|---|----------|----------|----------|
| | GW01 | GW04 | GW14 | GW16 |
| Aluminum | 323 U | 169 UB | 318 U | 302 U |
| Antimony | 15.0 U | 15.0 U | 15.0 U | 15.0 U |
| Arsenic | 18.5 | 2.0 U | 2.0 U | 2.0 U |
| Barium | 475 | 412 | 289 | 73.4 B |
| Beryllium | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| Cadmium | 2.0 U | 2.0 U | 2.0 U | 2.0 U |
| Calcium | 47000 J | 202000 J | 591000 J | 95600 J |
| Chromium | 66.9 J | 17.1 | 3.0 U | 3.9 UB |
| Cobalt | 18.2 B | 4.0 U | 4.5 B | 4.0 U |
| Copper | 7.7 B | 2.5 B | 2.0 U | 2.0 U |
| Iron | 4340 J | 29600 J | 75.1 JB | 77.3 UB |
| Lead | 8.8 | 9.0 | 5.0 | 4.1 |
| Magnesium | 179000 | 176000 | 106 U | 24100 |
| Manganese | 21.3 | 543 | 15.5 | 113 |
| Mercury | 0.20 UJN | 0.20 UJN | 0.20 UJN | 0.20 UJN |
| Nickel | 176 | 10.0 U | 10.0 U | 10.0 U |
| Potassium | 714000 | 95000 | 148000 | 47800 |
| Selenium | 4.1 B | 4.0 U | 4.0 U | 4.0 U |
| Silver | 2.0 U | 2.0 U | 2.0 U | 2.0 U |
| Sodium | 2350000 J | 248000 J | 261000 J | 199000 J |
| Thallium | 8.2 B | 13.8 | 14.2 | 6.0 U |
| Vanadium | 24.0 B | 5.9 B | 5.0 U | 5.2 B |
| Zinc | 14.7 B | 2.0 U | 2.0 U | 2.0 U |
| Cyanide | 22.7 | 10.1 | 10.0 U | 10.0 U |

GWmetals

| Volatile Organic Analysis for Soil Samples Land & Lakes #3 | | | | | | |
|---|---|--------|--------|--------|--------|--------|
| Volatile Compound | Sample Locations and Number Concentrations in ug/kg | | | | | |
| | SS01 | SS02 | SS03 | SS04 | SS05 | SS06 |
| Chloromethane | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| Bromomethane | 14 U | 13 U | 13 UJ | 14 UJ | 12 UJ | 14 UJ |
| Vinyl Chloride | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| Chloroethane | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| Methylene Chloride | 14 UJB | 13 UJB | 13 UJB | 14 UJB | 16 UB | 25 UB |
| Acetone | 14 UJB | 15 UB | 19 UB | 14 UJB | 16 UB | 14 UJB |
| Carbon Disulfide | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| 1,1-Dichloroethene | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| 1,1-Dichloroethane | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| 1,2-Dichloroethene (total) | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| Chloroform | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| 1,2-Dichloroethane | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| 2-Butanone | 14 UJB | 13 UJB | 13 UJB | 14 U | 12 UJB | 14 U |
| 1,1,1-Trichloroethane | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| Carbon Tetrachloride | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| Bromodichloromethane | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| 1,2-Dichloropropane | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| cis-1,3-Dichloropropene | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| Trichloroethene | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| Dibromochloromethane | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| 1,1,2-Trichloroethane | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| Benzene | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| trans-1,3-Dichloropropene | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| Bromoform | 14 U | 13 U | 13 U | 14 U | 12 U | 14 U |
| 4-Methyl-2-Pentanone | 14 U | 13 U | 13 U | 14 U | 12 U | 14 UJ |
| 2-Hexanone | 14 U | 13 U | 13 U | 14 U | 12 U | 14 UJ |
| Tetrachloroethene | 14 U | 13 U | 13 U | 14 U | 12 U | 14 UJ |
| 1,1,2,2-Tetrachloroethane | 14 U | 13 U | 13 U | 14 U | 12 U | 14 UJ |
| Toluene | 14 U | 13 U | 13 U | 14 U | 12 U | 4 J |
| Chlorobenzene | 14 U | 13 U | 13 U | 14 U | 12 U | 14 UJ |
| Ethylbenzene | 14 U | 13 U | 13 U | 14 U | 12 U | 14 UJ |
| Styrene | 14 U | 13 U | 13 U | 14 U | 12 U | 14 UJ |
| Xylene (total) | 14 U | 13 U | 13 U | 14 U | 12 U | 4 J |
| Total Number of TICs * | 0 | 0 | 0 | 1 | 1 | 1 |

* Number, not concentrations, of tentatively identified compounds (TICs).

as-vol

| Volatile Organic Analysis for Soil Samples | | | |
|--|----------------|-------------------------|----|
| Tentatively Identified Compounds | | | |
| Land & Lakes #3 | | | |
| Concentrations in ug/kg | | | |
| Compound Name | Retention Time | Estimated Concentration | |
| Sample SS04 | | | |
| Trichlorofluoromethane | 3.18 | 8 | JN |
| Sample SS05 Background | | | |
| Trichlorofluoromethane | 3.18 | 8 | JN |
| Sample SS06 Background | | | |
| Trichlorofluoromethane | 3.17 | 13 | JN |

vtic-ss

Semivolatile Organic Analysis for Soil Samples
Land & Lakes #3

| Semivolatile Compound | Sample Location and Number | | | | | |
|------------------------------|----------------------------|---------|---------|---------|-----------------|-----------------|
| | Concentrations in ug/kg | | | | | |
| | SS01 | SS02 | SS03 | SS04 | SS05 Background | SS06 Background |
| Phenol | 120 J | 130 J | 430 UJ | 180 JD | 1200 UJ | 1400 UJ |
| bis(2-Chloroethyl)Ether | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 2-Chlorophenol | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 1,3-Dichlorobenzene | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 1,4-Dichlorobenzene | 52 J | 880 UJ | 430 UJ | 310 JD | 1200 UJ | 1400 UJ |
| 1,2-Dichlorobenzene | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 2-Methylphenol | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 2,2'-oxybis(1-Chloropropane) | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 4-Methylphenol | 130 J | 120 J | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| n-Nitroso-Di-n-Propylamine | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| Hexachloroethane | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| Nitrobenzene | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| Isophorone | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 2-Nitrophenol | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 2,4-Dimethylphenol | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| bis(2-Chloroethoxy)Methane | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 2,4-Dichlorophenol | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 1,2,4-Trichlorobenzene | 900 UJ | 880 UJ | 430 UJ | 290 JD | 1200 UJ | 1400 UJ |
| Naphthalene | 240 J | 390 J | 84 J | 270 JD | 110 JD | 540 JD |
| 4-Chloroaniline | 140 J | 880 UJ | 430 UJ | 1500 JD | 240 JD | 1400 UJ |
| Hexachlorobutadiene | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 4-Chloro-3-Methylphenol | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 2-Methylnaphthalene | 150 J | 270 J | 140 J | 2700 UJ | 96 JD | 290 JD |
| Hexachlorocyclopentadiene | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 2,4,6-Trichlorophenol | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 2,4,5-Trichlorophenol | 2200 UJ | 2100 UJ | 1100 UJ | 6700 UJ | 2900 UJ | 3300 UJ |
| 2-Chloronaphthalene | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 2-Nitroaniline | 2200 UJ | 2100 UJ | 1100 UJ | 6700 UJ | 2900 UJ | 3300 UJ |
| Dimethyl Phthalate | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| Acenaphthylene | 160 J | 120 J | 430 UJ | 200 JD | 260 JD | 490 JD |
| 2,6-Dinitrotoluene | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 3-Nitroaniline | 2200 UJ | 2100 UJ | 1100 UJ | 6700 UJ | 2900 UJ | 3300 UJ |
| Acenaphthene | 200 J | 490 J | 39 J | 2700 UJ | 180 JD | 290 JD |
| 2,4-Dinitrophenol | 2200 UJ | 2100 UJ | 1100 UJ | 6700 UJ | 2900 UJ | 3300 UJ |
| 4-Nitrophenol | 2200 UJ | 2100 UJ | 1100 UJ | 6700 UJ | 2900 UJ | 3300 UJ |
| Dibenzofuran | 150 J | 340 J | 51 J | 2700 UJ | 120 JD | 270 JD |
| 2,4-Dinitrotoluene | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| Diethylphthalate | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| 4-Chlorophenyl-phenylether | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| Fluorene | 230 J | 570 J | 55 J | 150 JD | 240 JD | 400 JD |
| 4-Nitroaniline | 2200 UJ | 2100 UJ | 1100 UJ | 6700 UJ | 2900 UJ | 3300 UJ |

Semivolatile Organic Analysis for Soil Samples (Continued)
Land & Lakes #3

| Semivolatile Compound | Sample Location and Number Concentrations in ug/kg | | | | | |
|----------------------------|---|---------|---------|-----------|-----------------|-----------------|
| | SS01 | SS02 | SS03 | SS04 | SS05 Background | SS06 Background |
| 4,6-Dinitro-2-Methylphenol | 2200 UJ | 2100 UJ | 1100 UJ | 6700 UJ | 2900 UJ | 3300 UJ |
| n-Nitrosodiphenylamine | 900 UJ | 880 UJ | 430 UJ | 140 JD | 1200 UJ | 1400 UJ |
| 4-Bromophenyl-phenylether | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 1200 UJ | 1400 UJ |
| Hexachlorobenzene | 900 UJ | 880 UJ | 430 UJ | 2700 UJ | 180 JD | 1400 UJ |
| Pentachlorophenol | 2200 UJ | 2100 UJ | 1100 UJ | 6700 UJ | 2900 UJ | 3300 UJ |
| Phenanthrene | 1600 J | 3900 J | 370 J | 500 JD | 2500 JD | 4200 JD |
| Anthracene | 410 J | 840 J | 50 J | 2700 UJ | 560 JD | 760 JD |
| Carbazole | 170 J | 420 J | 32 J | 2700 UJ | 290 JD | 410 JD |
| di-n-Butylphthalate | 900 UJ | 880 UJB | 430 UJ | 2700 UJ | 1200 UJBD | 1400 UJBD |
| Fluoranthene | 2200 J | 6200 J | 350 J | 760 JD | 4800 JD | 5200 JD |
| Pyrene | 2100 J | 5700 J | 360 J | 1200 JD | 6100 JD | 6000 JD |
| Butylbenzylphthalate | 900 UJ | 880 UJ | 430 U | 2700 UJ | 1200 UJ | 1400 UJ |
| 3,3'-Dichlorobenzidine | 900 UJ | 880 UJ | 430 U | 2700 UJ | 1200 UJ | 1400 UJ |
| Benzo(a)Anthracene | 1500 J | 3100 J | 270 J | 530 JD | 2800 JD | 3100 JD |
| Chrysene | 1300 J | 3000 J | 250 J | 660 JD | 3100 JD | 3300 JD |
| bis(2-Ethylhexyl)Phthalate | 1700 JB | 1600 JB | 430 UJB | 130000 BD | 1200 UJBD | 1400 UJBD |
| di-n-Octyl Phthalate | 900 UJ | 880 UJ | 430 UJ | 160 JD | 1200 UJ | 1400 UJ |
| Benzo(b)Fluoranthene | 1900 JB | 3500 JB | 430 UJB | 2700 UJBD | 2800 BD | 3300 JD |
| Benzo(k)Fluoranthene | 1600 J | 4000 J | 230 J | 900 JD | 3600 JD | 3900 JD |
| Benzo(a)Pyrene | 1200 JB | 2800 JB | 230 JB | 2700 UJBD | 2700 BD | 2800 JBD |
| Indeno(1,2,3-cd)Pyrene | 320 J | 770 J | 87 J | 390 JD | 1200 JD | 1000 JD |
| Dibenzo(a,h)Anthracene | 900 UJ | 470 J | 36 J | 2700 UJ | 450 JD | 740 JD |
| Benzo(g,h,i)Perylene | 110 J | 280 J | 32 J | 400 JD | 480 JD | 410 JD |
| Total Number of TICs* | 20 | 20 | 19 | 20 | 20 | 20 |

* Number, not concentrations, of tentatively identified compounds (TICs).

SS-SV

Semivolatile Organic Analysis for Soil Samples
 Tentatively Identified Compounds
 Land & Lakes #3
 Concentrations in ug/kg

| Compound Name | Retention Time | Estimated Concentration |
|------------------------------|----------------|-------------------------|
| Sample SS01 | | |
| Unknown | 7.35 | 780 UJB |
| Unknown | 7.97 | 2700 UJB |
| Unknown Alkane | 9.12 | 480 J |
| Unknown Alkane | 11.05 | 690 J |
| Chloroisocyanato Benzene | 11.78 | 730 JN |
| Unknown Alkane | 12.87 | 610 J |
| Unknown Alkane | 13.10 | 520 J |
| Unknown Alkane | 14.55 | 740 J |
| Dichlorocyanato Benzene Isom | 14.80 | 670 J |
| Unknown Alkane | 16.13 | 650 J |
| Unknown Alkane | 20.48 | 990 J |
| Unknown Alkane | 23.27 | 510 J |
| Unknown Alkane | 23.47 | 1000 J |
| Unknown | 23.63 | 980 J |
| Unknown | 23.90 | 660 J |
| Unknown | 25.35 | 490 J |
| Unknown | 30.33 | 530 J |
| Unknown Alkane | 32.10 | 1000 J |
| Unknown | 32.55 | 1100 J |
| Unknown Alkane | 34.60 | 1100 J |
| Sample SS02 | | |
| Unknown | 7.27 | 790 UJB |
| Unknown | 7.90 | 2800 UJB |
| Unknown Alkane | 10.98 | 790 J |
| Unknown Alkane | 12.80 | 760 J |
| Unknown Alkane | 14.48 | 950 J |
| Unknown Alkane | 16.08 | 620 J |
| Unknown Alkane | 18.98 | 720 J |
| Unknown Alkane | 20.33 | 760 J |
| Unknown Alkane | 20.42 | 1100 J |
| Unknown Alkane | 22.75 | 850 J |
| Unknown Organic Acid | 23.40 | 700 J |
| Unknown | 24.77 | 1000 J |
| Unknown Alkane | 24.87 | 730 J |
| Unknown Polynuclear Aromatic | 26.55 | 1400 J |
| Unknown Alkane | 28.53 | 1600 J |
| Unknown Polynuclear Aromatic | 29.13 | 1200 J |
| Unknown Alkane | 29.35 | 1200 J |
| Unknown Alkane | 30.15 | 1800 J |
| Unknown Polynuclear Aromatic | 32.30 | 1700 J |
| Unknown Alkane | 39.53 | 1400 J |

Semivolatile Organic Analysis for Soil Samples (Continued)

Tentatively Identified Compounds

Land & Lakes #3

Concentrations in ug/kg

| Compound Name | Retention Time | Estimated Concentration |
|-------------------------------|----------------|-------------------------|
| Sample SS03 | | |
| Unknown | 7.23 | 620 UJB |
| Unknown Alkane | 7.67 | 430 J |
| Unknown | 7.87 | 1400 UJB |
| Unknown | 8.20 | 530 J |
| Unknown Alkane | 9.02 | 730 J |
| Unknown Alkane | 9.47 | 500 J |
| Unknown Alkane | 10.95 | 920 J |
| Unknown Alkane | 12.75 | 870 J |
| Unknown Alkane | 13.00 | 630 J |
| Unknown | 13.28 | 420 J |
| Unknown Alkane | 14.00 | 480 J |
| Unknown Alkane | 14.45 | 890 J |
| Unknown Alkane | 16.03 | 510 J |
| Unknown Alkane | 16.98 | 390 J |
| Unknown Alkane | 18.95 | 370 J |
| Unknown Alkane | 19.62 | 340 J |
| Unknown Alkane | 20.37 | 850 J |
| Unknown Alkane | 22.70 | 390 J |
| Unknown | 28.50 | 450 J |
| Sample SS04 | | |
| Chloroisocyanato Benzene | 11.73 | 2200 JN |
| Dichloroisocyanato Benzene Is | 14.75 | 2700 J |
| Unknown | 23.22 | 4700 J |
| Unknown | 23.35 | 4100 J |
| Unknown | 23.57 | 7000 J |
| Unknown | 23.63 | 6400 J |
| Unknown | 23.85 | 3500 J |
| Unknown | 25.28 | 5100 J |
| Unknown | 30.28 | 2200 J |
| Unknown | 30.37 | 1600 J |
| Unknown | 31.30 | 4000 J |
| Unknown | 31.72 | 3300 J |
| Unknown | 32.05 | 2300 J |
| Unknown | 32.50 | 3400 J |
| Unknown | 33.03 | 2500 J |
| Unknown | 33.17 | 1400 J |
| Unknown | 33.63 | 1500 J |
| Unknown | 34.55 | 7000 J |
| Unknown | 35.08 | 6300 J |
| Unknown | 35.68 | 3500 J |

Semivolatile Organic Analysis for Soil Samples (Continued)

Tentatively Identified Compounds

Land & Lakes #3

Concentrations in ug/kg

| Compound Name | Retention Time | Estimated Concentration |
|------------------------------|----------------|-------------------------|
| Sample SS05 Background | | |
| Unknown | 7.35 | 730 UJB |
| Unknown | 7.65 | 1200 J |
| Unknown | 7.97 | 1300 UJB |
| Unknown | 10.02 | 650 J |
| Dichloroisocyanato Benzene | 14.80 | 670 J |
| Unknown Alkane | 20.48 | 500 J |
| Unknown Polynuclear Aromatic | 23.50 | 650 J |
| Unknown | 24.92 | 430 J |
| Unknown Polynuclear Aromatic | 26.60 | 710 J |
| Tiphenyl Ester Phosphoric Ac | 28.05 | 2100 JNB |
| Unknown | 28.23 | 1300 J |
| Unknown | 28.33 | 690 J |
| Unknown Polynuclear Aromatic | 29.18 | 760 J |
| Unknown Polynuclear Aromatic | 29.93 | 830 J |
| Unknown Alkane | 30.20 | 690 J |
| Unknown | 30.32 | 860 J |
| Unknown | 31.40 | 700 J |
| Unknown Alkane | 31.82 | 1500 J |
| Unknown Polynuclear Aromatic | 32.35 | 2200 J |
| Unknown Alkane | 33.85 | 930 J |
| Sample SS06 Background | | |
| Unknown | 7.33 | 990 U |
| Unknown | 7.65 | 830 J |
| Unknown | 7.97 | 2300 UJB |
| Unknown | 10.02 | 690 J |
| Unknown Alkane | 20.48 | 560 J |
| Unknown Polynuclear Aromatic | 23.18 | 420 J |
| Unknown Polynuclear Aromatic | 23.27 | 640 J |
| Unknown Polynuclear Aromatic | 23.50 | 860 J |
| Unknown | 24.00 | 450 J |
| Unknown Polynuclear Aromatic | 26.60 | 750 J |
| Unknown Polynuclear Aromatic | 26.87 | 440 J |
| Unknown | 27.95 | 380 U |
| Unknown | 28.23 | 520 J |
| Unknown | 28.48 | 420 J |
| Unknown Polynuclear Aromatic | 29.93 | 470 J |
| Unknown Alkane | 30.20 | 630 J |
| Unknown | 30.30 | 420 J |
| Unknown Alkane | 31.82 | 2700 J |
| Unknown Polynuclear Aromatic | 32.35 | 2000 J |
| Unknown Alkane | 33.85 | 1900 J |

SVIC-ss

| Pesticide/PCB Analysis for Soil Samples Land & Lakes #3 | | | | | | |
|--|----------------------------|--------|--------|------------|------------|--------|
| Pesticide/ PCB | Sample Location and Number | | | | | |
| | Concentrations in ug/kg | | | | | |
| | SS01 | SS02 | SS03 | SS04 | SS05 | SS06 |
| | | | | Background | Background | |
| Alpha-BHC | 2.3 UJ | 2.3 UJ | 2.2 UJ | 2.4 UJ | 2.1 U | 2.4 U |
| Beta-BHC | 2.3 UJ | 2.3 UJ | 2.2 UJ | 2.4 UJ | 2.1 U | 2.4 U |
| Delta-BHC | 2.3 UJ | 2.3 UJ | 2.2 UJ | 7.8 JPX | 2.1 U | 2.4 U |
| Gamma-BHC (Lindane) | 2.3 UJ | 2.3 UJ | 2.2 UJ | 6.2 JPX | 2.1 U | 2.4 U |
| Heptachlor | 2.3 UJ | 2.3 UJ | 2.2 UJ | 2.4 UJ | 2.1 U | 2.4 U |
| Aldrin | 2.9 UJPX | 2.3 JP | 2.2 UJ | 5.9 JPX | 3.1 U | 3.5 PX |
| Heptachlor Epoxide | 2.3 UJ | 2.3 UJ | 2.2 UJ | 12 J | 2.1 U | 2.4 U |
| Endosulfan I | 2.3 UJ | 2.3 UJ | 2.2 UJ | 2.4 U | 2.1 U | 2.4 U |
| Dieldrin | 7.3 J | 4.4 UJ | 4.3 UJ | 28 JPX | 4.0 U | 4.6 U |
| 4,4'-DDE | 5.6 J | 4.4 UJ | 4.3 UJ | 24 JP | 4.4 PX | 8.0 P |
| Endrin | 4.5 UJ | 4.4 UJ | 4.3 UJ | 4.6 UJ | 4.2 PX | 4.6 U |
| Endosulfan II | 4.5 UJ | 4.4 UJ | 4.3 UJ | 4.6 UJ | 4.0 U | 4.6 U |
| 4,4'-DDD | 4.9 JP | 5.5 JP | 4.3 UJ | 25 J | 4.6 PX | 4.6 U |
| Endosulfan Sulfate | 4.5 UJ | 6.1 JP | 4.3 UJ | 4.6 UJ | 4.0 U | 4.6 U |
| 4,4'-DDT | 4.5 UJ | 4.4 UJ | 4.3 UJ | 4.6 UJ | 18 PX | 21 P |
| Methoxychlor | 23 UJ | 23 UJ | 22 UJ | 24 UJ | 65 PX | 24 U |
| Endrin Ketone | 4.5 UJ | 4.4 UJ | 4.3 UJ | 4.6 UJ | 4.0 U | 7.5 P |
| Endrin Aldehyde | 4.5 UJ | 4.4 UJ | 4.3 UJ | 4.6 UJ | 4.0 U | 4.6 U |
| Alpha-Chlordane | 5.6 JPX | 2.3 UJ | 2.2 UJ | 2.4 UJ | 2.1 U | 2.4 U |
| Gamma-Chlordane | 5.1 JPX | 2.3 UJ | 2.2 UJ | 2.4 UJ | 2.1 U | 2.4 U |
| Toxaphene | 230 UJ | 230 UJ | 220 UJ | 240 UJ | 210 U | 240 U |
| Aroclor-1016 | 45 UJ | 44 UJ | 43 UJ | 46 UJ | 40 U | 46 U |
| Aroclor-1221 | 92 UJ | 89 UJ | 88 UJ | 93 UJ | 82 U | 93 U |
| Aroclor-1232 | 45 UJ | 44 UJ | 43 UJ | 46 UJ | 40 U | 46 U |
| Aroclor-1242 | 180 J | 44 UJ | 490 J | 46 UJ | 40 U | 46 U |
| Aroclor-1248 | 45 UJ | 44 UJ | 43 UJ | 46 UJ | 40 U | 46 U |
| Aroclor-1254 | 140 J | 59 J | 43 UJ | 610 J | 40 U | 46 U |
| Aroclor-1260 | 45 UJ | 44 UJ | 43 UJ | 46 UJ | 40 U | 46 U |

Pestsoil

Inorganic Analysis for Soil Samples
Land & Lakes #3

| Metals and Cyanide | Sample Locations and Number Concentrations in mg/kg | | | | | |
|--------------------------|--|----------|----------|---------|--------------------|--------------------|
| | SS01 | SS02 | SS03 | SS04 | SS05 Background | SS06 Background |
| Aluminum | 9400 | 12600 | 9830 | 12000 | 8010 | 9530 |
| Antimony | 6.2 JBN | 5.8 RUN | 4.6 RUN | 6.4 RUN | 5.9 JBN | 5.6 RUN |
| Arsenic | 9.1 | 7.0 | 8.6 | 20.7 | 6.7 | 17.3 |
| Barium | 82.2 | 89.7 | 54.7 | 610 | 75.1 | 114 |
| Beryllium | 0.61 B | 1.0 B | 0.65 B | 0.71 B | 0.74 B | 0.98 B |
| Cadmium | 2.4 | 1.2 U | 0.91 U | 24.7 | 1.2 | 2.8 |
| Calcium | 71100 | 70300 | 56400 | 51500 | 74700 | 64900 |
| Chromium | 113 JN* | 35.5 JN* | 24.7 JN* | 248 JN* | 37.6 JN* | 74.5 JN* |
| Cobalt | 10.3 B | 10.8 B | 12.8 | 13.4 B | 9.0 B | 9.8 B |
| Copper | 49.8 | 53.2 | 36.5 | 163 | 36.3 | 73.4 |
| Iron | 22100 | 21300 | 24100 | 28900 | 19700 | 57500 |
| Lead | 70.3 | 57.7 | 47.1 | 463 | 153 | 215 |
| Magnesium | 33800 | 29900 | 29100 | 24100 | 23300 | 20900 |
| Manganese | 1740 J* | 672 J* | 522 J* | 589 J* | 614 J* | 1230 J* |
| Mercury | 0.16 JN | 0.11 JN | 0.08 JBN | 1.0 JN | 0.15 N | 0.32 JN |
| Nickel | 30.9 | 39.0 | 37.9 | 44.1 | 24.5 | 50.4 |
| Potassium | 3000 J | 3830 | 2670 | 3160 | 2380 J | 2560 J |
| Selenium | 0.68 JBW | 0.51 JBW | 0.31 JBW | 3.2 S | 0.57 JB | 0.87 JB |
| Silver | 1.1 U | 1.1 U | 0.87 U | 5.0 | 0.94 U | 1.1 U |
| Sodium | 266 JB | 1100 JB | 251 JB | 174 JB | 369 B | 549 JB |
| Thallium | 0.71 B | 0.59 B | 0.82 B | 0.68 B | 0.56 B | 0.96 B |
| Vanadium | 43.4 | 25.9 | 20.1 | 35.2 | 25.4 | 36.9 |
| Zinc | 164 | 116 | 246 | 711 | 240 | 472 |
| Cyanide | 0.89 | 0.63 U | 0.67 U | 22.2 | 0.62 U | 0.95 |

so metal

| Volatile Compounds | Sample Locations and Number / Concentration in ug/kg | | | | | | | | | | | | | |
|----------------------------|--|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| | ST01 | ST02 | ST03 | ST04 | ST05 | ST06 | ST07 | ST08 | ST09 | ST10 | ST11 | ST12 | ST13 | ST14 |
| | Background | Background | Background | Background | Background | Background | Background | Background | Background | Background | Background | Background | Background | Background |
| Chloromethane | 12 U | 12 U | 27 UJ | 20 UJ | 12 U | 16 UJ | 17 U | 18 U | 74 UJ | 16 UJ | 12 U | 14 UJ | 16 UJ | 18 UJ |
| Bromomethane | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| Vinyl Chloride | 12 U | 12 U | 27 UJ | 20 UJ | 12 U | 16 UJ | 17 U | 18 U | 74 UJ | 16 UJ | 12 U | 14 UJ | 16 UJ | 18 UJ |
| Chloroethane | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| Methylene Chloride | 12 U | 12 U | 83 | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| Acetone | 12 U | 12 U | 120 | 120 | 12 U | 15 U | 24 | 270 | 74 U | 21 | 12 U | 14 U | 23 | 29 |
| Carbon Disulfide | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| 1,1-Dichloroethene | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| 1,1-Dichloroethane | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| 1,2-Dichloroethene (total) | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 38 | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| Chloroform | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| 1,2-Dichloroethane | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| 2-Butanone | 12 U | 12 U | 27 U | 32 | 12 U | 16 U | 17 U | 19 | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| 1,1,1-Trichloroethane | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| Carbon Tetrachloride | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| Bromodichloromethane | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| 1,2-Dichloroproppane | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| cis-1,3-Dichloropropene | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| Trichloroethene | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 16 J | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| Dibromochloromethane | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| 1,1,2-Trichloroethane | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| Benzene | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 44 | 53 | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| trans-1,3-Dichloropropene | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| Bromoform | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 U | 12 U | 14 U | 16 U | 18 U |
| 4-Methyl-2-Pentanone | 12 U | 12 U | 27 U | 20 U | 12 UJ | 16 U | 17 UJ | 18 UJ | 74 U | 16 UJ | 12 UJ | 14 UJ | 16 UJ | 18 UJ |
| 2-Hexanone | 12 U | 12 U | 27 U | 20 U | 12 UJ | 16 U | 17 UJ | 18 UJ | 74 U | 16 UJ | 12 UJ | 14 UJ | 16 UJ | 18 UJ |
| Tetrachloroethene | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 UJ | 12 U | 14 UJ | 16 UJ | 18 UJ |
| 1,1,2,2-Tetrachloroethane | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 UJ | 12 U | 14 UJ | 16 UJ | 18 UJ |
| Toluene | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 33 | 76 | 74 U | 16 UJ | 12 U | 14 UJ | 16 UJ | 18 UJ |
| Chlorobenzene | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 20 | 74 U | 16 UJ | 12 U | 14 UJ | 16 UJ | 18 UJ |
| Ethylbenzene | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 30 | 840 | 16 UJ | 12 U | 14 UJ | 16 UJ | 100 J |
| Styrene | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 17 U | 18 U | 74 U | 16 UJ | 12 U | 14 UJ | 16 UJ | 18 UJ |
| Xylene (total) | 12 U | 12 U | 27 U | 20 U | 12 U | 16 U | 38 | 130 | 3300 | 16 UJ | 12 U | 14 UJ | 18 J | 380 J |
| Total Number of TICS * | 1 | 0 | 1 | 3 | 0 | 0 | 10 | 10 | 10 | 0 | 0 | 2 | 1 | 10 |

* Number, not concentrations, of tentatively identified compounds (TICs).

| Volatile Organic Analysis for Sediment Samples Tentatively Identified Compounds Land & Lakes #3 Concentrations in ug/Kg | | |
|--|----------------|-------------------------|
| Compound Name | Retention Time | Estimated Concentration |
| Sample ST01 | | |
| Unknown (BP M/E 40) | 11.35 | 16 J |
| Sample ST03 | | |
| Thiobismethane | 4.22 | 16 JN |
| Sample ST04 | | |
| Unknown (BP M/E 40) | 12.22 | 20 J |
| Unknown (BP M/E 69) | 13.38 | 13 J |
| Alkylbenzene Isomer (BP M/E) | 14.12 | 44 J |
| Sample ST07 | | |
| Unknown (BP M/E 45) | 3.72 | 660 J |
| Unknown HC Coelute (BP M/E 4 | 13.07 | 27 J |
| Unknown HC (BP M/E 43) | 13.80 | 55 J |
| Unknown HC (BP M/E 43) | 14.43 | 150 J |
| Unknown HC Coelute (BP M/E 5 | 14.67 | 28 J |
| Unknown HC Coelute (BP M/E 4 | 14.88 | 22 J |
| Unknown HC (BP M/E 43) | 15.43 | 60 J |
| Unknown HC Coelute (BP M/E 5 | 15.60 | 54 J |
| Unknown HC (BP M/E 57) | 16.03 | 320 J |
| Unknown HC (BP M/E 57) | 16.20 | 39 J |
| Sample ST08 | | |
| Unknown (BP M/E 59) | 3.70 | 150 J |
| Unknown (BP M/E 40) | 7.78 | 20 J |
| Unknown (BP M/E 40) | 10.15 | 15 J |
| Unknown (BP M/E 40) | 12.03 | 19 J |
| C10.H16 Isomer (BP M/E 93) | 12.23 | 40 J |
| Unknown (BP M/E 57) | 13.05 | 21 J |
| Unknown (BP M/E 40) | 13.68 | 13 J |
| Unknown (BP M/E 57) | 13.85 | 16 J |
| Unknown HC Coelute (BP M/E 4 | 14.43 | 25 J |
| Unknown HC Coelute (BP M/E 5 | 16.03 | 21 J |
| Sample ST09 | | |
| Unknown (BP M/E 43) | 6.87 | 1400 J |
| Methylcyclohexane | 7.82 | 1200 JN |
| Unknown HC (BP M/E 57) | 12.05 | 1200 J |
| Unknown HC (BP M/E 57) | 13.08 | 1800 J |
| Unknown HC (BP M/E 57) | 13.52 | 680 J |
| C9.H12 Isomer (BP M/E 105) | 13.72 | 680 J |
| Unknown (BP M/E 57) | 13.88 | 2200 J |
| Unknown HC (BP M/E 43) | 14.47 | 3100 J |
| Unknown (BP M/E 57) | 14.72 | 790 J |
| Unknown HC (BP M/E 57) | 16.07 | 2900 J |

| Volatile Organic Analysis for Sediment Samples (Continued) | | |
|--|----------------|-------------------------|
| Tentatively Identified Compounds | | |
| Land & Lakes #3 | | |
| Concentrations in ug/kg | | |
| Compound Name | Retention Time | Estimated Concentration |
| Sample ST12 | | |
| Unknown (BP M/E 40) | 13.88 | 14 J |
| Unknown (BP M/E 40) | 14.47 | 16 J |
| Sample ST13 | | |
| C10.H16 Isomer (BP M/E 68) | 14.08 | 35 J |
| Sample ST14 | | |
| Unknown HC (BP M/E 57) | 12.02 | 400 J |
| Unknown HC (BP M/E 57) | 13.07 | 710 J |
| Unknown HC (BP M/E 57) | 13.52 | 350 J |
| Unknown (BP M/E 57) | 13.87 | 1100 J |
| Unknown HC (BP M/E 43) | 14.45 | 950 J |
| Unknown HC Coelute (BP M/E 5 | 14.70 | 260 J |
| Unknown HC Coelute (BP M/E 5 | 14.90 | 160 J |
| Unknown HC (BP M/E 57) | 15.47 | 270 J |
| Unknown HC Coelute (BP M/E 5 | 15.62 | 190 J |
| Unknown HC (BP M/E 57) | 16.05 | 500 J |

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| Semivolatile Organic Analysis for Sediment Samples Land & Lakes #3 | | | | | | | |
|---|----------------------------|--------|--------|---------|---------|---------|---------|
| Semivolatile Compound | Sample Location and Number | | | | | | |
| | Concentrations in ug/kg | | | | | | |
| | ST01 | ST02 | ST03 | ST04 | ST05 | ST06 | ST07 |
| Phenol | 400 U | 410 U | 2100 | 1700 U | 820 U | 2500 U | 2500 |
| bis(2-Chloroethyl)Ether | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 2-Chlorophenol | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 1,3-Dichlorobenzene | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 1,4-Dichlorobenzene | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 1,2-Dichlorobenzene | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 2-Methylphenol | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 2,2'-oxybis(1-Chloropropane) | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 4-Methylphenol | 400 U | 410 U | 890 | 1700 U | 820 U | 2500 U | 3700 |
| n-Nitroso-Di-n-Propylamine | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| Hexachloroethane | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| Nitrobenzene | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| Isophorone | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 2-Nitrophenol | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 2,4-Dimethylphenol | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| bis(2-Chloroethoxy)Methane | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 2,4-Dichlorophenol | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 1,2,4-Trichlorobenzene | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| Naphthalene | 400 U | 430 | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 4-Chloroaniline | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| Hexachlorobutadiene | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 4-Chloro-3-Methylphenol | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 2-Methylnaphthalene | 400 U | 220 J | 790 U | 1700 U | 2000 U | 2500 U | 980 U |
| Hexachlorocyclopentadiene | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 2,4,6-Trichlorophenol | 400 U | 410 U | 790 U | 1700 U | 2000 U | 2500 U | 980 U |
| 2,4,5-Trichlorophenol | 960 U | 990 U | 1900 U | 4100 U | 820 U | 6100 U | 2400 U |
| 2-Chloronaphthalene | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 2-Nitroaniline | 960 U | 990 U | 1900 U | 4100 U | 820 U | 6100 U | 2400 U |
| Dimethyl Phthalate | 400 U | 410 U | 790 U | 1700 U | 2000 U | 2500 U | 980 U |
| Acenaphthylene | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 2,6-Dinitrotoluene | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 3-Nitroaniline | 960 U | 990 U | 1900 U | 4100 U | 2000 U | 6100 U | 2400 U |
| Acenaphthene | 400 U | 690 | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 2,4-Dinitrophenol | 960 UJ | 990 UJ | 1900 U | 4100 UJ | 2000 UJ | 6100 UJ | 2400 UJ |
| 4-Nitrophenol | 960 U | 990 U | 1900 U | 4100 U | 2000 U | 6100 UJ | 2400 U |
| Dibenzofuran | 400 U | 510 | 790 U | 1700 U | 820 U | 2500 U | 980 U |

| Semivolatile Organic Analysis for Sediment Samples (Continued) | | | | | | | |
|--|----------------------------|---------|--------|---------|--------|---------|--------|
| Land & Lakes #3 | | | | | | | |
| Semivolatile Compound | Sample Location and Number | | | | | | |
| | ST01 | ST02 | ST03 | ST04 | ST05 | ST06 | ST07 |
| 2,4-Dinitrotoluene | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| Diethylphthalate | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 4-Chlorophenyl-phenylether | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| Fluorene | 400 U | 870 | 790 U | 1300 U | 820 U | 2500 U | 540 U |
| 4-Nitroaniline | 960 U | 990 U | 1900 U | 4100 U | 2000 U | 6100 U | 2400 U |
| 4,6-Dinitro-2-Methylphenol | 960 U | 990 U | 1900 U | 4100 U | 2000 U | 6100 U | 2400 U |
| n-Nitrosodiphenylamine | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| 4-Bromophenyl-phenylether | 400 UJ | 410 UJ | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| Hexachlorobenzene | 400 U | 410 U | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| Pentachlorophenol | 960 UJ | 990 U | 1900 U | 4100 U | 2000 U | 6100 U | 2400 U |
| Phanthrene | 340 J | 7400 D | 1400 | 12000 | 1500 | 4200 D | 4000 |
| Anthracene | 400 U | 2200 | 790 U | 3000 | 450 J | 1400 DJ | 1100 |
| Carbazole | 400 U | 930 | 790 U | 1100 J | 820 U | 2500 U | 980 U |
| di-n-Butylphthalate | 400 UJ | 410 UJ | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| Fluoranthene | 410 | 12000 D | 2200 | 19000 D | 3000 | 10000 D | 5900 |
| Pyrene | 320 J | 9300 D | 1900 | 17000 D | 2500 | 8800 D | 4800 |
| Butylbenzylphthalate | 400 U | 520 | 790 U | 1700 UJ | 820 UJ | 2500 U | 980 UJ |
| 3,3'-Dichlorobenzidine | 400 UJ | 410 UJ | 790 U | 1700 UJ | 820 UJ | 2500 U | 980 UJ |
| Benzo(a)Anthracene | 400 U | 5400 D | 1000 | 7600 | 1700 | 3300 D | 2600 |
| Chrysene | 250 J | 5600 D | 1200 | 9000 | 1900 | 3800 D | 2900 |
| bis(2-Ethylhexyl)Phthalate | 290 J | 2000 JD | 780 J | 8800 | 500 J | 2500 U | 4100 |
| di-n-Octyl Phthalate | 400 UJ | 290 J | 790 U | 1700 U | 820 U | 2500 U | 980 U |
| Benzo(b)Fluoranthene | 400 U | 4300 D | 910 | 6100 | 2000 | 3300 D | 2700 |
| Benzo(k)Fluoranthene | 400 UJ | 3200 J | 670 J | 7100 | 2200 | 3200 D | 2900 |
| Benzo(a)Pyrene | 400 U | 4100 D | 830 | 6300 | 2100 | 3900 D | 2400 |
| Indeno(1,2,3-cd)Pyrene | 400 U | 3600 JD | 680 J | 4400 | 1800 | 2800 DJ | 1500 |
| Dibenzo(a,h)Anthracene | 400 U | 1100 | 790 U | 1800 | 820 U | 2500 U | 620 J |
| Benzo(g,h,i)Perylene | 400 U | 2100 | 420 J | 2500 | 1100 | 1900 DJ | 950 J |
| Total Number of TICs* | 20 | 20 | 20 | 20 | 20 | 20 | 20 |

* Number, not concentrations, of tentatively identified compounds (TICs).

Semivolatile Organic Analysis for Sediment Samples (Continued)

Land & Lakes #3

| Semivolatile Compound | Sample Location and Number | | | | | | |
|------------------------------|----------------------------|--------------------|--------------------|--------------------|--------|---------|--------|
| | Concentrations in mg/kg | | | | | | |
| | ST08 Background | ST09 Background | ST10 Background | ST11 Background | ST12 | ST13 | ST14 |
| Phenol | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| bis(2-Chloroethyl)Ether | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 2-Chlorophenol | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 1,3-Dichlorobenzene | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 1,4-Dichlorobenzene | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 1,2-Dichlorobenzene | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 2-Methylphenol | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 2,2'-oxybis(1-Chloropropane) | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 4-Methylphenol | 1300 | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| n-Nitroso-Di-n-Propylamine | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| Hexachloroethane | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| Nitrobenzene | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| Isophorone | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 2-Nitrophenol | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 2,4-Dimethylphenol | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| bis(2-Chloroethoxy)Methane | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 2,4-Dichlorophenol | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 1,2,4-Trichlorobenzene | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| Naphthalene | 740 J | 3600 U | 520 U | 390 U | 970 U | 400 J | 890 U |
| 4-Chloroaniline | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| Hexachlorobutadiene | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 4-Chloro-3-Methylphenol | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 2-Methylnaphthalene | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| Hexachlorocyclopentadiene | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 2,4,6-Trichlorophenol | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 2,4,5-Trichlorophenol | 2500 U | 8800 U | 1200 U | 940 U | 2400 U | 1300 U | 2200 U |
| 2-Chloronaphthalene | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 2-Nitroaniline | 2500 U | 8800 U | 1200 U | 940 U | 2400 U | 1300 U | 2200 U |
| Dimethyl Phthalate | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| Acenaphthylene | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 2,6-Dinitrotoluene | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 3-Nitroaniline | 2500 U | 8800 U | 1200 U | 940 U | 2400 U | 1300 U | 2200 U |
| Acenaphthene | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 2,4-Dinitrophenol | 2500 UJ | 8800 UJ | 1200 U | 940 UJ | 2400 U | 1300 UJ | 2200 U |
| 4-Nitrophenol | 2500 U | 8800 UJ | 1200 UJ | 940 U | 2400 U | 1300 UJ | 2200 U |
| Dibenzofuran | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |

| Semivolatile Organic Analysis for Sediment Samples (Continued) | | | | | | | |
|--|----------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Land & Lakes #3 | | | | | | | |
| Semivolatile Compound | Sample Location and Number | | | | | | |
| | Concentrations in mg/kg | | | | | | |
| | ST08 Background | ST09 Background | ST10 Background | ST11 Background | ST12 Background | ST13 Background | ST14 Background |
| 2,4-Dinitrotoluene | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| Diethylphthalate | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 4-Chlorophenyl-phenylether | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| Fluorene | 1000 U | 3600 U | 520 U | 390 U | 650 J | 520 U | 890 U |
| 4-Nitroaniline | 2500 U | 8800 U | 1200 U | 940 U | 2400 U | 1300 U | 2200 U |
| 4,6-Dinitro-2-Methylphenol | 2500 U | 8800 U | 1200 U | 940 U | 2400 U | 1300 U | 2200 U |
| n-Nitrosodiphenylamine | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 4-Bromophenyl-phenylether | 1000 UJ | 3600 U | 520 U | 390 UJ | 970 U | 520 U | 890 U |
| Hexachlorobenzene | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| Pentachlorophenol | 2500 U | 8800 U | 1200 U | 940 U | 2400 U | 1300 U | 2200 UJ |
| Phenanthrene | 3000 | 6400 D | 580 | 1400 | 2800 | 1100 | 920 |
| Anthracene | 840 J | 3600 U | 520 U | 420 | 750 J | 350 J | 890 U |
| Carbazole | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| di-n-Butylphthalate | 1000 UJ | 3600 U | 520 U | 390 UJ | 970 U | 520 U | 890 U |
| Fluoranthene | 3900 | 7100 D | 770 | 2600 | 4200 | 1200 | 2400 |
| Pyrene | 2800 | 5400 D | 700 | 1900 | 4500 | 1500 | 2400 J |
| Butylbenzylphthalate | 1000 U | 3600 U | 520 U | 390 U | 970 U | 520 U | 890 U |
| 3,3'-Dichlorobenzidine | 1000 UJ | 3600 U | 520 U | 390 UJ | 970 U | 520 U | 890 U |
| Benzo(a)Anthracene | 1700 | 3100 JD | 320 J | 1600 | 2000 | 710 | 1200 |
| Chrysene | 2100 | 3600 JD | 370 J | 1500 | 2200 | 930 | 1400 |
| bis(2-Ethylhexyl)Phthalate | 3600 J | 11000 D | 520 U | 1000 J | 1200 | 2500 | 890 U |
| di-n-Octyl Phthalate | 1000 UJ | 19000 D | 520 U | 390 UJ | 970 U | 520 U | 890 U |
| Benzo(b)Fluoranthene | 1400 | 3600 U | 520 U | 970 | 1700 | 1100 | 1500 |
| Benzo(k)Fluoranthene | 1200 J | 3600 U | 520 U | 940 J | 1700 | 620 | 1400 |
| Benzo(a)Pyrene | 1700 | 2500 JD | 520 U | 1200 | 1700 | 850 | 1300 |
| Indeno(1,2,3-cd)Pyrene | 1900 | 2900 JD | 520 UJ | 1200 | 1200 J | 1100 J | 1200 J |
| Dibenzo(a,h)Anthracene | 710 J | 3600 U | 520 U | 440 | 970 U | 310 J | 890 U |
| Benzo(g,h,i)Perylene | 1200 | 3600 U | 520 U | 650 | 660 J | 640 | 670 J |
| Total Number of TICs* | 20 | 20 | 20 | 20 | 20 | 20 | 20 |

* Number, not concentrations, of tentatively identified compounds (TICs).

SEDM-SV

| Semivolatile Organic Analysis for Sediment Samples Tentatively Identified Compounds Land & Lakes #3 Concentrations in ug/kg | | |
|--|----------------|-------------------------|
| Compound Name | Retention Time | Estimated Concentration |
| Sample ST01 | | |
| Unknown HC (BP M/E 57) | 6.95 | 730 J |
| Unknown HC (BP M/E 43) | 8.50 | 840 J |
| Unknown HC (BP M/E 43) | 9.03 | 860 J |
| Unknown HC (BP M/E 43) | 10.80 | 1500 J |
| Unknown HC (BP M/E 57) | 12.83 | 1500 J |
| Unknown HC (BP M/E 57) | 13.10 | 1100 J |
| Unknown HC (BP M/E 57) | 14.72 | 2500 J |
| Tetrahydrotrimethylnaphthalene | 15.82 | 1000 J |
| Unknown HC (BP M/E 57) | 16.47 | 2300 J |
| Alkylbenzene Isomer (BP M/E) | 16.52 | 740 J |
| Unknown (BP M/E 83) | 17.27 | 1000 J |
| Unknown HC (BP M/E 71) | 17.48 | 1500 J |
| Benzene, 1-Isopentyl-2,4,5-T | 17.55 | 1100 JN |
| Unknown HC (BP M/E 57) | 18.10 | 1800 J |
| Trimethylnaphthalene Isomer | 18.93 | 960 J |
| Unknown HC (BP M/E 57) | 19.63 | 1400 J |
| Unknown HC (BP M/E 57) | 21.12 | 1300 J |
| Unknown HC (BP M/E 71) | 21.18 | 2600 J |
| Unknown HC (BP M/E 57) | 22.50 | 950 J |
| Unknown HC (BP M/E 57) | 22.62 | 1000 J |
| Sample ST03 | | |
| Unknown HC Coelute (BP M/E 4 | 14.67 | 3000 J |
| Unknown HC (BP M/E 57) | 21.13 | 2400 J |
| Nonylphenol Isomer (BP M/E 1 | 21.40 | 1900 J |
| Tetramethylbutylphenol Isom | 21.95 | 2000 J |
| Methylphenylethylphenol Isom | 23.47 | 5500 J |
| Hexadecanoic Acid | 24.67 | 5100 JN |
| Sulfur, Mol. (S8) | 25.80 | 3500 JN |
| Unknown (BP M/E 55) | 26.85 | 3400 J |
| Octadecanoic Acid | 27.07 | 2000 JN |
| Unknown HC (BP M/E 57) | 32.58 | 1800 J |
| 1,3-Cyclopentadiene, 1,2,3,4 | 34.15 | 2200 JN |
| Unknown HC (BP M/E 57) | 34.40 | 4200 J |
| Unknown (BP M/E 57) | 34.55 | 1600 J |
| Unknown HC (BP M/E 57) | 36.10 | 2700 J |
| Unknown (BP M/E 55) | 36.27 | 6400 J |
| Unknown Sterol Isomer (BP M/ | 36.62 | 5700 J |
| Unknown (BP M/E 69) | 37.03 | 2100 J |
| Unknown (BP M/E 43) | 37.53 | 2400 J |
| Unknown (BP M/E 43) | 37.93 | 10000 J |
| Unknown Sterol Isomer (BP M/ | 38.27 | 6400 J |

Semivolatile Organic Analysis for Sediment Samples (Continued)

Tentatively Identified Compounds

Land & Lakes #3

Concentrations in ug/kg

| Compound Name | Retention Time | Estimated Concentration |
|-------------------------------|----------------|-------------------------|
| Sample ST04 | | |
| C15.H10 PNA Isomer (BP M/E 1) | 24.23 | 7300 J |
| Hexadecanoic Acid | 24.67 | 9700 JN |
| Sulfur, Mol (S8) | 25.80 | 8000 JN |
| C16.H13 N Isomer (BP M/E 218) | 26.78 | 9300 J |
| C17.H12 PNA Isomer Coelute | 27.85 | 14000 J |
| C17.H12 PNA Isomer Coelute | 28.05 | 7700 J |
| Unknown PNA Isomer (BP M/E 2) | 29.87 | 8600 J |
| Unknown HC (BP M/E 57) | 31.63 | 6000 J |
| Unknown PNA/HC Coelute (BP M | 32.20 | 10000 J |
| C20.H12 PNA Isomer (BP M/E 2 | 34.37 | 15000 J |
| Unknown HC Coelute (BP M/E 5 | 35.05 | 7500 J |
| Unknown (BP M/E 57) | 35.90 | 8800 J |
| Unknown Sterol Isomer (BP M/ | 39.27 | 29000 J |
| C27.H45.O Isomer (BP M/E 55) | 36.62 | 27000 J |
| Unknown (BP M/E 57) | 36.72 | 14000 J |
| Unknown (BP M/E 191) | 36.82 | 6000 J |
| Unknown PNA Isomer Coelute (| 37.05 | 7200 J |
| Unknown (BP M/E 57) | 37.53 | 11000 J |
| Unknown (BP M/E 43) | 37.95 | 14000 J |
| Uknown Sterol lsomer (BP M/ | 38.27 | 10000 J |
| Sample ST05 | | |
| Unknown HC (BP M/E 57) | 16.40 | 1400 J |
| Unknown HC (BP M/E 57) | 21.13 | 2000 J |
| C15.H10 PNA Isomer (BP M/E 1 | 24.23 | 1400 J |
| C17.H12 PNA Isomer Coelute | 27.85 | 2500 J |
| Unknown PNA Isomer Coelute | 29.45 | 1200 J |
| Unknown PNA Isomer Coelute | 29.87 | 1900 J |
| C.18.H12 PNA Isomer Coelute | 30.83 | 1300 J |
| Unknown (BP M/E 242) | 31.18 | 1200 J |
| Unknown HC Coelute (BP M/E 5 | 31.63 | 1300 J |
| Unknown HC Coelute (BP M/E 5 | 32.17 | 2000 J |
| Unknown (BP M/E 95) | 32.32 | 1200 J |
| C20.H12 PNA Isomer (BP M/E 2 | 33.93 | 3700 J |
| Unknown (BP M/E 268 | 34.23 | 1900 J |
| C20.H12 PNA Isomer (BP M/E 2 | 34.38 | 4400 J |
| C20.H12 PNA Isomer (BP M/E 2 | 34.73 | 1500 J |
| Unknown (BP M/E 57) | 36.10 | 2300 J |
| Unknown (BP M/E 55) | 36.23 | 1300 J |
| Unknown (BP M/E 95) | 36.82 | 2900 J |
| Unknown PNA Isomer Coelute | 37.03 | 1500 J |
| Unknown PNA Isomer Coelute | 37.63 | 1700 J |

Semivolatile Organic Analysis for Sediment Samples (Continued)
 Tentatively Identified Compounds
 Land & Lakes #3
 Concentrations in ug/kg

| Compound Name | Retention Time | Estimated Concentration |
|--------------------------------|----------------|-------------------------|
| Sample ST06 | | |
| Unknown PNA Isomer (BP M/E 1) | 24.22 | 2900 J |
| Benzonaphthofuran Isomer COE | 26.77 | 2800 J |
| C17.H12 PNA Isomer (BP M/E 2) | 27.83 | 3300 J |
| C17.H12 PNA Isomer (BP M/E 2) | 28.03 | 2100 J |
| Benzonaphthothiophene Isomer | 29.72 | 2000 J |
| Unknown PNA Isomer (BP M/E 2) | 29.83 | 2600 J |
| C18.H12 PNA Isomer Coelute | 30.82 | 2700 J |
| C20.H12 PNA Isomer Coelute | 33.90 | 5300 J |
| C20.H12 PNA Isomer (BP M/E 2) | 34.35 | 6900 J |
| C20.H12 PNA Isomer Coelute | 34.70 | 2400 J |
| Unknown (BP M/E 69) | 36.07 | 3200 J |
| Unknown (BP M/E 43) | 36.35 | 3900 J |
| Unknown (BP M/E 55) | 36.58 | 3000 J |
| Unknown (BP M/E 43) | 36.68 | 2800 J |
| Unknown (BP M/E 69) | 36.78 | 4200 J |
| Unknown (BP M/E 276) | 37.02 | 2300 J |
| Unknown (BP M/E 69) | 37.62 | 3800 J |
| Unknown (BP M/E 40) | 37.72 | 2900 J |
| Unknown (BP M/E 43) | 38.02 | 5500 J |
| Unknown (BP M/E 69) | 38.23 | 1900 J |
| Sample ST07 | | |
| III-Indole | 14.68 | 6000 JN |
| Unknown HC (BP M/E 57) | 21.05 | 5900 J |
| Tetradecanoic Acid | 22.05 | 8300 JN |
| Unknown (BP M/E 55) | 23.58 | 5900 J |
| Hexadecanoic Acid | 24.75 | 24000 JN |
| Sulfur, Mol. (S8) | 25.82 | 6700 JN |
| Unknown HC Coelute (BP M/E 5) | 26.95 | 8800 J |
| Octadecanoic Acid | 27.12 | 6200 JN |
| C17.H12 PNA Isomer Coelute | 27.85 | 7500 J |
| Unknown HC (BP M/E 57) | 31.65 | 5800 J |
| Unknown (BP M/E 57) | 32.35 | 6100 J |
| Unknown (BP M/E 57) | 33.28 | 8500 J |
| Unknown HC Coelute (BP M/E 57) | 34.18 | 7300 J |
| C20.H12 PNA Isomer Coelute | 34.40 | 6600 J |
| Unknown (BP M/E 57) | 35.05 | 9000 J |
| Unknown (BP M/E 57) | 35.88 | 5800 J |
| Unknown Sterol Isomer (BP M/ | 36.25 | 7600 J |
| C27.H46.O Isomer (BP M/E 55) | 36.60 | 7100 J |
| Unknown (BP M/E 57) | 36.70 | 6500 J |
| Unknown (BP M/E 55) | 38.25 | 6200 J |

Semivolatile Organic Analysis for Sediment Samples (Continued)
 Tentatively Identified Compounds
 Land & Lakes #3
 Concentrations in ug/kg

| Compound Name | Retention Time | Estimated Concentration |
|-------------------------------|----------------|-------------------------|
| Sample ST08 (Background) | | |
| Unknown HC Coelute (BP M/E 5) | 14.68 | 2900 J |
| Unknown HC (BP M/E 57) | 16.42 | 2000 J |
| Unknown HC (BP M/E 57) | 18.07 | 1700 J |
| Unknown HC (BP M/E 57) | 19.60 | 1700 J |
| Unknown HC (BP M/E 57) | 21.08 | 2100 J |
| Unknown HC Coelute (BP M/E 5) | 21.15 | 1800 J |
| Dibenzothiophene Isomer (BP | 22.00 | 1400 J |
| Unknown Nitrile (BP M/E 97) | 23.88 | 3000 J |
| Unknown (BP M/E 135) | 24.25 | 1900 J |
| Hexadecanoic Acid | 24.65 | 4100 JN |
| Sulfur, Mol. (S8) | 25.82 | 3400 JN |
| Unknown (BP M/E 55) | 26.15 | 1700 J |
| Unknown Nitrile (BP M/E 43) | 26.43 | 2700 J |
| Benzonaphthofuran Isomer (BP | 26.78 | 1500 J |
| C17.H12 PNA Isomer Coelute | 27.85 | 1400 J |
| C20.H12 PNA Isomer Coelute | 33.90 | 1900 J |
| C20.H12 PNA Isomer (BP M/E 2 | 34.35 | 1300 J |
| Unknown Sterol Isomer (BP M/ | 36.23 | 1900 J |
| Unknown Sterol Isomer (BP M/ | 36.58 | 1700 J |
| Unknown Sterol Isomer (BP M/ | 38.23 | 2300 J |
| Sample ST09 | | |
| Unknown HC (BP M/E 57) | 21.02 | 5400 J |
| C14.H16 Isomer (BP M/E 104) | 21.87 | 5600 J |
| C17.H12 PNA Isomer Coelute (| 27.75 | 6800 J |
| Unknown (BP M/E 91) | 30.23 | 23000 J |
| 1,2-Benzenedicarboxylic Acid | 31.08 | 19000 JN |
| Unknown (BP M/E 91) | 31.23 | 12000 J |
| Unknown (BP M/E 91) | 31.37 | 22000 J |
| Unknown (BP M/E 91) | 31.43 | 5200 J |
| Unknown (BP M/E 91) | 31.53 | 11000 J |
| Benzenedicarboxylic Acid Iso | 32.23 | 13000 J |
| Benzenedicarboxylic Acid Iso | 32.33 | 8300 J |
| Unknown (BP M/E 149) | 33.78 | 6100 J |
| Benzenedicarboxylic Acid Iso | 34.03 | 18000 J |
| Unknown (BP M/E 149) | 34.18 | 8400 J |
| Benzenedicarboxylic Acid Iso | 34.77 | 39000 J |
| Benzenedicarboxylic Acid Iso | 35.70 | 6600 J |
| Benzenedicarboxylic Acid Iso | 35.77 | 6700 J |
| Unknown (BP M/E 57) | 35.98 | 5200 J |
| Benzenedicarboxylic Acid Iso | 36.42 | 24000 J |
| Unknown (BP M/E 69) | 36.70 | 6700 J |

Semivolatile Organic Analysis for Sediment Samples (Continued)
 Tentatively Identified Compounds
 Land & Lakes #3
 Concentrations in ug/kg

| Compound Name | Retention Time | Estimated Concentration |
|-------------------------------|----------------|-------------------------|
| Sample ST10 Background | | |
| Ethanol, 2,2'-Oxybis-, Diace | 8.80 | 2000 JN |
| Unknown HC (BP M/E 43) | 10.73 | 750 J |
| Unknown HC (BP M/E 57) | 14.67 | 1200 J |
| Unknown HC (BP M/E 57) | 16.42 | 1400 J |
| Unknown HC (BP M/E 57) | 17.43 | 940 J |
| Unknown HC (BP M/E 57) | 18.07 | 1300 J |
| Unknown HC (BP M/E 57) | 19.60 | 1000 J |
| Unknown HC (BP M/E 57) | 21.08 | 2800 J |
| Unknown HC (BP M/E 57) | 21.15 | 1400 J |
| Unknown HC (BP M/E 57) | 22.47 | 740 J |
| Unknown HC (BP M/E 57) | 22.58 | 1100 J |
| Unknown (BP M/E 43) | 23.12 | 780 J |
| Sulfur, Mol. (S8) | 25.83 | 2500 JN |
| 2-Hexadecen-1-OL, 3,7,11,15- | 26.57 | 1600 JN |
| Unknown (BP M/E 69) | 33.87 | 790 J |
| C20.H12 PNA Isomer Coelute (| 34.38 | 920 J |
| Unknown (BP M/E 43) | 36.35 | 750 J |
| Unknown Sterol Isomer (BP M/ | 36.67 | 1300 J |
| Unknown Sterol Isomer (BP M/ | 37.58 | 930 J |
| Unknown Sterol Isomer (BP M/ | 37.72 | 750 J |
| Sample ST11 | | |
| Unknown HC (BP M/E 57) | 14.70 | 980 J |
| Unknown HC (BP M/E 57) | 16.43 | 1000 J |
| Unknown HC (BP M/E 57) | 17.47 | 610 J |
| Unknown HC (BP M/E 57) | 18.08 | 820 J |
| Trimethylnaphthalene Isomer | 18.92 | 490 J |
| Unknown HC (BP M/E 57) | 19.62 | 800 J |
| Unknown HC (BP M/E 57) | 21.10 | 870 J |
| Unknown HC (BP M/E 71) | 21.17 | 1500 J |
| Dibenzothiophene Isomer (BP | 22.02 | 580 J |
| Unknown (BP M/E 134) | 23.37 | 670 J |
| C15.H12 PNA Isomer (BP M/E 1 | 23.95 | 660 J |
| Unknown PNA Isomer (BP M/E 1 | 24.27 | 760 J |
| Hexadecanoic Acid | 24.67 | 670 JN |
| Sulfur Mol. (S8) | 25.83 | 550 JN |
| Benzonaphthofuran Isomer (BP | 26.80 | 570 J |
| C17.H12 PNA Isomer (BP M/E 2 | 27.87 | 770 J |
| C18.H10 PNA Isomer (BP M/E 2 | 29.88 | 500 J |
| C20.H12 PNA Isomer (BP M/E 2 | 33.93 | 590 J |
| C20.H12 PNA Isomer (BP M/E 2 | 34.37 | 800 J |
| C20.H12 PNA Isomer (BP M/E 2 | 34.72 | 660 J |

Semivolatile Organic Analysis for Sediment Samples (Continued)
 Tentatively Identified Compounds
 Land & Lakes #3
 Concentrations in ug/kg

| Compound Name | Retention Time | Estimated Concentration |
|------------------------------|----------------|-------------------------|
| Sample ST12 | | |
| Ethanol, 2,2'-Oxybis-, Diace | 8.78 | 2500 JN |
| Unknown HC (BP M/E 43) | 14.67 | 2000 J |
| Unknown HC (BP M/E 57) | 16.42 | 2400 J |
| Unknown HC (BP M/E 57) | 17.43 | 1600 J |
| Unknown HC (BP M/E 57) | 18.05 | 2200 J |
| Unknown HC (BP M/E 57) | 19.60 | 1600 J |
| Unknown HC (BP M/E 57) | 21.07 | 3800 J |
| Unknown HC (BP M/E 57) | 21.13 | 3100 J |
| Unknown PNA Isomer (BP M/E 1 | 24.25 | 3000 J |
| Sulfur, Mol. (S8) | 25.80 | 3700 JN |
| Unknown PNA Isomer Coelute (| 27.87 | 2800 J |
| Unknown (BP M/E 41) | 28.83 | 1500 J |
| Unknown PNA Isomer (BP M/E 2 | 29.87 | 2600 J |
| Unknown (BP M/E 163) | 30.10 | 2300 J |
| C20.H28.02 Isomer (BP M/E 23 | 30.40 | 11000 J |
| Unknown (BP M/E 91) | 30.82 | 5500 J |
| Unknown (BP M/E 217) | 31.38 | 1500 J |
| Unknown (BP M/E 69) | 33.85 | 2100 J |
| C20.H12 PNA Isomer Coelute (| 34.38 | 3200 J |
| Unknown (BP M/E 43) | 36.37 | 3300 J |
| Sample ST13 | | |
| Unknown HC (BP M/E 57) | 14.63 | 1800 J |
| Unknown HC (BP M/E 57) | 21.13 | 2800 J |
| Unknown HC (BP M/E 57) | 22.58 | 2200 J |
| Hexadecanoic Acid | 24.70 | 1600 JN |
| Unknown (BP M/E 57) | 27.87 | 2600 J |
| Unknown (BP M/E 55) | 30.10 | 1900 J |
| Unknown (BP M/E 81) | 31.23 | 1800 J |
| Unknown (BP M/E 81) | 32.37 | 2000 J |
| Unknown (BP M/E 43) | 33.23 | 1600 J |
| Unknown (BP M/E 69) | 33.63 | 1700 J |
| Unknown (BP M/E 81) | 33.92 | 4700 J |
| Unknown (BP M/E 95) | 35.00 | 1600 J |
| Unknown (BP M/E 57) | 35.10 | 1600 J |
| Unknown (BP M/E 69) | 36.13 | 4300 J |
| Unknown (BP M/E 55) | 36.35 | 5600 J |
| Unknown Sterol Isomer (BP M/ | 36.67 | 5700 J |
| Unknown (BP M/E 69) | 36.87 | 3300 J |
| Unknown (BP M/E 55) | 37.10 | 1700 J |
| Unknown (BP M/E 57) | 37.68 | 1800 J |
| Unknown (BP M/E 43) | 38.00 | 3800 J |

Semivolatile Organic Analysis for Sediment Samples (Continued)

Tentatively Identified Compounds

Land & Lakes #3

Concentrations in ug/kg

| Compound Name | Retention Time | Estimated Concentration |
|-------------------------------|----------------|-------------------------|
| Sample ST14 | | |
| Ethanol, 2,2'-Oxybis-, Diace | 8.78 | 1700 JN |
| Unknown HC (BP M/E 57) | 19.58 | 830 J |
| Unknown HC (BP M/E 57) | 21.05 | 1000 J |
| Unknown HC (BP M/E 57) | 21.12 | 1000 J |
| Unknown PNA Isomer (BP M/E 1) | 24.25 | 720 J |
| Hexadecanoic Acid | 24.63 | 670 JN |
| C17.H12 PNA Isomer Coelute (| 27.85 | 1200 J |
| Unknown PNA Isomer Coelute (| 29.87 | 750 J |
| Unknown PNA Isomer (BP M/E 2) | 31.38 | 710 J |
| Unknown (BP M/E 109) | 33.28 | 740 J |
| Unknown (BP M/E 69) | 34.38 | 1700 J |
| C20.H12 PNA Isomer Coelute (| 35.03 | 1200 J |
| Unknown (BP M/E 57) | 35.87 | 1500 J |
| Unknown (BP M/E 57) | 36.08 | 1100 J |
| Unknown (BP M/E 43) | 36.35 | 670 J |
| Unknown (BP M/E 43) | 36.68 | 2200 J |
| Unknown (BP M/E 81) | 36.80 | 1100 J |
| Unknown (BP M/E 43) | 37.48 | 1200 J |
| Unknown (BP M/E 43) | 37.62 | 810 J |
| Unknown (BP M/E 43) | 38.25 | 1400 J |

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| Pesticide/PCB Analysis for Sediment Samples Land & Lakes #3 | | | | | | | | | | | | | | |
|--|---|--------|--------|--------|--------|--------|--------|--------------------|----------|--------------------|--------------------|--------|---------|--------|
| Pesticide/ PCB | Sample Location and Number Concentrations in ug/kg | | | | | | | | | | | | | |
| | ST01 | ST02 | ST03 | ST04 | ST05 | ST06 | ST07 | ST08 Background | ST09 | ST10 Background | ST11 Background | ST12 | ST13 | ST14 |
| | Alpha-BHC | 2.0 UJ | 2.1 UJ | 4.0 UJ | 2.9 UJ | 2.1 UJ | 2.6 UJ | 2.5 UJ | 2.7 UJ | 12 UJ | 2.7 UJ | 2.0 UJ | 2.5 UJ | 13 UJ |
| Beta-BHC | 2.0 UJ | 2.1 UJ | 4.0 UJ | 2.9 UJ | 2.1 UJ | 2.6 UJ | 2.5 UJ | 2.7 UJ | 12 UJ | 2.7 UJ | 2.0 UJ | 2.5 UJ | 13 UJ | 2.3 U |
| Delta-BHC | 2.0 UJ | 2.1 UJ | 4.0 UJ | 21 JY | 2.1 UJ | 3.2 J | 2.8 JP | 2.7 UJ | 12 UJ | 2.7 UJ | 5.6 JP | 2.6 JP | 13 UJ | 2.3 U |
| Gamma-BHC (Lindane) | 2.0 UJ | 2.1 UJ | 4.0 UJ | 2.9 UJ | 2.1 UJ | 2.6 UJ | 2.5 UJ | 2.7 UJ | 12 UJ | 2.7 UJ | 2.0 UJ | 2.5 UJ | 13 UJ | 2.3 U |
| Heptachlor | 2.0 UJ | 2.1 UJ | 4.0 UJ | 2.9 UJ | 2.1 UJ | 2.6 UJ | 2.5 UJ | 2.7 UJ | 12 UJ | 2.7 UJ | 2.0 UJ | 3.7 JY | 13 UJ | 2.3 U |
| Aldrin | 2.0 UJ | 2.1 UJ | 5.0 JY | 6.9 JY | 2.1 UJ | 7.0 JY | 6.1 JY | 7.0 JY | 12 UJ | 2.7 UJ | 3.0 JY | 50 JY | 13 UJ | 2.3 U |
| Heptachlor Epoxide | 2.0 UJ | 2.1 UJ | 4.0 UJ | 2.9 UJ | 2.1 UJ | 6.7 JY | 2.5 UJ | 3.2 JY | 12 UJ | 2.7 UJ | 2.0 UJ | 2.5 UJ | 20 JY | 2.3 UJ |
| Endosulfan I | 2.0 UJ | 2.1 UJ | 4.0 UJ | 7.0 JY | 2.1 UJ | 2.6 UJ | 2.5 UJ | 2.7 UJ | 12 UJ | 2.7 UJ | 2.0 UJ | 2.5 UJ | 13 UJ | 2.3 U |
| Dieldrin | 4.0 UJ | 4.1 UJ | 7.9 UJ | 5.7 UJ | 4.1 UJ | 15 JP | 6.7 JP | 6.1 JY | 23 UJ | 5.2 UJ | 6.8 JP | 4.9 UJ | 26 UJ | 4.5 U |
| 4,4'-DDE | 4.0 UJ | 4.5 JY | 7.7 J | 12 JP | 4.1 UJ | 23 J | 43 J | 12 JY | 23 UJ | 5.2 UJ | 3.9 UJ | 8.0 JY | 32 JY | 4.5 U |
| Endrin | 4.0 UJ | 4.1 UJ | 7.9 UJ | 5.7 UJ | 6.6 JY | 11 JY | 7.1 JY | 6.1 JY | 23 UJ | 5.2 UJ | 5.0 JY | 4.9 UJ | 23 UJ | 4.5 UJ |
| Endosulfan II | 4.0 UJ | 4.1 UJ | 7.9 UJ | 5.7 UJ | 5.0 JY | 5.0 UJ | 7.0 JY | 7.0 JY | 23 UJ | 5.2 UJ | 3.9 UJ | 5.2 JY | 23 UJ | 4.5 U |
| 4,4'-DDD | 3.8 UJ | 12 J | 7.9 UJ | 24 J | 6.2 J | 24 J | 27 J | 20 J | 31 JD | 5.7 J | 3.6 JP | 25 J | 26 UJ | 5.2 |
| Endosulfan Sulfate | 4.0 UJ | 5.0 JY | 7.9 UJ | 5.7 UJ | 24 JY | 5.0 UJ | 4.9 UJ | 5.2 UJ | 23 UJ | 5.2 UJ | 3.9 UJ | 4.9 UJ | 26 UJ | 4.5 U |
| 4,4'-DDT | 4.0 UJ | 2.9 JP | 7.9 UJ | 10 JP | 11 JP | 16 JP | 9.9 JP | 9.9 JP | 25 JPD | 5.2 UJ | 3.9 UJ | 23 J | 26 UJ | 3.5 JP |
| Methoxychlor | 20 UJ | 19 J | 62 J | 62 J | 28 JP | 26 JP | 36 J | 40 JP | 41 JPD | 27 UJ | 75 J | 24 JP | 130 UJ | 24 |
| Endrin Ketone | 4.0 UJ | 9.4 JY | 7.9 UJ | 25 J | 20 JY | 5.0 UJ | 16 JY | 14 JY | 23 UJ | 5.2 UJ | 15 JY | 4.9 UJ | 26 UJ | 4.5 U |
| Endrin Aldehyde | 4.0 UJ | 4.1 UJ | 7.9 UJ | 5.7 UJ | 4.1 UJ | 8.0 JY | 4.9 UJ | 5.2 UJ | 23 UJ | 5.2 UJ | 3.9 UJ | 4.9 UJ | 26 UJ | 4.5 U |
| Alpha-Chlordane | 1.6 JP | 2.0 JP | 4.0 UJ | 9.2 JY | 1.5 JP | 6.8 JP | 9.0 JY | 6.9 JY | 12 UJ | 2.7 UJ | 4.0 J | 5.2 JP | 9.9 JP | 2.3 U |
| Gamuna-Chlordane | 2.6 JP | 4.4 JP | 4.0 UJ | 9.8 JP | 4.1 JP | 9.0 JP | 14 JP | 12 JP | 31 JPD | 2.7 UJ | 2.0 JP | 4.0 JP | 49 JD | 2.2 JP |
| Toxaphene | 200 UJ | 210 UJ | 400 UJ | 290 UJ | 210 UJ | 260 UJ | 250 UJ | 270 UJ | 1200 UJ | 270 UJ | 420 JY | 250 UJ | 1300 UJ | 230 U |
| Aroclor-1016 | 40 UJ | 130 JY | 79 UJ | 270 JY | 130 JY | 50 UJ | 260 JY | 280 JY | 230 UJ | 52 UJ | 170 JY | 49 UJ | 260 UJ | 45 U |
| Aroclor-1221 | 81 UJ | 170 JY | 160 UJ | 270 JY | 180 JY | 100 UJ | 320 JY | 340 JY | 460 UJ | 100 UJ | 170 JY | 99 UJ | 530 UJ | 91 U |
| Aroclor-1232 | 40 UJ | 170 JY | 79 UJ | 400 JY | 130 JY | 50 UJ | 320 JY | 340 JY | 230 UJ | 52 UJ | 250 JY | 49 UJ | 260 UJ | 45 U |
| Aroclor-1242 | 40 UJ | 130 JY | 79 UJ | 270 JY | 130 JY | 50 UJ | 260 JY | 280 JY | 230 UJ | 52 UJ | 170 JY | 49 UJ | 260 UJ | 45 U |
| Aroclor-1248 | 40 UJ | 130 JY | 160 JY | 270 JY | 130 JY | 170 JP | 260 JY | 280 JY | 1400 JPD | 80 JY | 220 JY | 170 JP | 2000 JD | 62 P |
| Aroclor-1254 | 40 J | 92 J | 200 JY | 200 JP | 110 J | 180 JP | 340 J | 350 J | 650 JD | 52 UJ | 170 JY | 100 JP | 970 JD | 45 P |
| Aroclor-1260 | 40 UJ | 100 JY | 79 UJ | 460 JY | 180 JY | 150 J | 370 JY | 400 JY | 340 JD | 52 UJ | 220 UJ | 49 UJ | 360 JD | 45 U |

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| Inorganic Analysis for Sediment Samples Land & Lakes #3 | | | | | | | | |
|--|---|----------|-----------|-----------|----------|----------|-----------|--------------------|
| Metals and Cyanide | Sample Location and Number Concentrations in mg/kg | | | | | | | |
| | ST01 | ST02 | ST03 | ST04 | ST05 | ST06 | ST07 | ST08 Background |
| Aluminum | 8740 J* | 12400 J* | 11400 J* | 16300 J* | 19100 J* | 13500 J* | 20100 J* | 21800 J* |
| Antimony | 15.3 | 16.0 | 8.3 B | 15.7 B | 10.5 B | 16.2 B | 7.2 B | 14.9 B |
| Arsenic | 7.5 J* | 11.2 J* | 19.5 J* | 9.0 J* | 7.4 J* | 9.7 J* | 6.5 J* | 9.3 J* |
| Barium | 35.9 B | 97.3 | 93.9 B | 259 | 201 | 142 | 244 | 224 |
| Beryllium | 0.86 B | 1.0 B | 1.4 B | 1.7 B | 1.8 | 1.3 B | 2.9 | 3.0 |
| Cadmium | 0.48 U | 1.3 | 1.5 B | 6.9 | 4.3 | 8.4 | 11.3 | 2.4 |
| Calcium | 42900 J* | 62000 J* | 132000 J* | 107000 J* | 97300 J* | 44400 J* | 108000 J* | 104000 J* |
| Chromium | 79.8 JN* | 47.4 JN* | 42.7 JN* | 192 JN* | 626 JN* | 153 JN* | 146 JN* | 109 JN* |
| Cobalt | 6.4 B | 9.3 B | 6.6 B | 7.9 B | 8.0 B | 7.7 B | 6.2 B | 8.5 B |
| Copper | 26.3 JN* | 45.4 JN* | 46.2 JN* | 151 JN* | 78.6 JN* | 99.8 JN* | 117 JN* | 82.4 JN* |
| Iron | 38100 J* | 22000 J* | 21700 J* | 28800 J* | 34300 J* | 27400 J* | 17900 J* | 42400 J* |
| Lead | 27.3 | 86.3 | 90.5 | 274 | 204 | 132 | 124 | 142 |
| Magnesium | 19300 J* | 28500 J* | 32700 J* | 36600 J* | 29400 J* | 18100 J* | 36100 J* | 34800 J* |
| Manganese | 1620 J* | 682 J* | 540 J* | 1600 J* | 4580 J* | 1140 J* | 1210 J* | 2120 J* |
| Mercury | 0.12 UN | 0.12 UN | 0.26 UN | 0.47 N | 0.27 N | 0.34 N | 0.56 N | 0.16 UN |
| Nickel | 32.4 | 27.3 | 28.0 | 46.4 | 156 | 35.8 | 36.4 | 72.0 |
| Potassium | 3240 * | 4020 * | 4360 * | 4110 * | 3300 * | 2430 * | 3690 * | 5400 * |
| Selenium | 0.95 U | 0.99 U | 2.1 U | 1.6 U | 1.0 U | 1.1 U | 1.4 B | 1.2 U |
| Silver | 0.90 JB | 0.89 B | 1.0 U | 6.4 | 2.4 JB | 5.2 | 3.9 J | 2.5 B |
| Sodium | 500 UB | 688 UB | 1620 UB | 32300 J | 925 UB | 1860 U | 1750 U | 1640 U |
| Thallium | 2.4 * | 1.5 U* | 3.1 U* | 3.3 B* | 4.0 * | 1.7 U* | 1.8 U* | 2.3 B* |
| Vanadium | 60.7 JN* | 35.1 JN* | 32.8 JN* | 54.3 JN* | 55.0 JN* | 39.6 JN* | 28.5 JN* | 39.6 JN* |
| Zinc | 49.0 * | 612 * | 151 * | 629 * | 303 * | 351 * | 307 * | 211 * |
| Cyanide | 0.66 | 0.62 U | 2.1 | 2.0 | 1.4 | 1.7 | 6.8 | 1.1 |

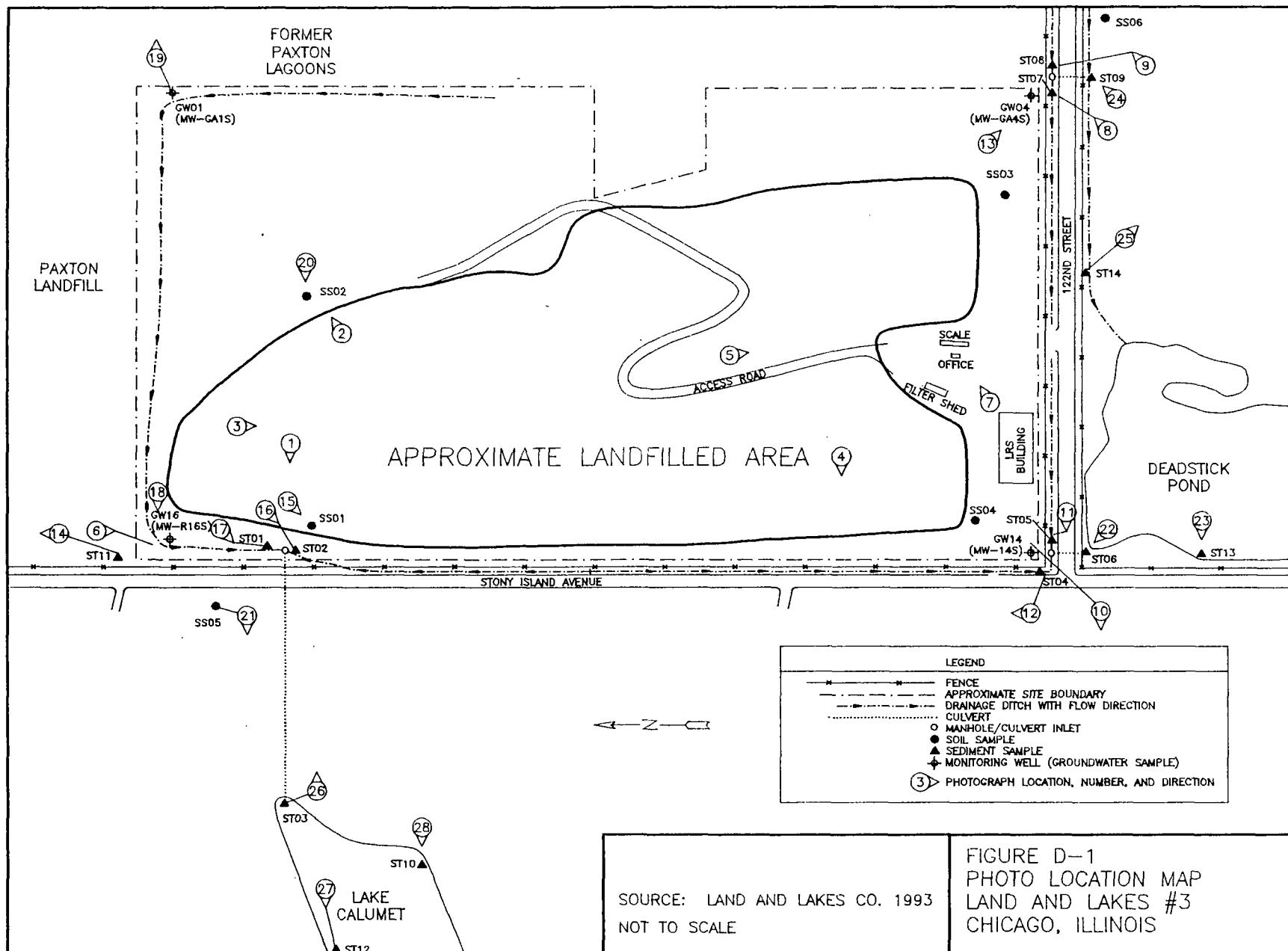
| Metals and Cyanide | Inorganic Analysis for Sediment Samples (Continued) | | | | | |
|--------------------|---|--------------------|--------------------|----------|----------|----------|
| | Land & Lakes #3 | | | | | |
| | Sample Location and Number | | | | | |
| | Concentrations in mg/kg | | | | | |
| | ST09 | ST10 Background | ST11 Background | ST12 | ST13 | ST14 |
| Aluminum | 7880 J* | 12800 J* | 8930 J* | 11700 J* | 12100 J* | 11600 J* |
| Antimony | 39.2 | 26.0 | 10.6 B | 17.6 B | 54.9 | 55.5 |
| Arsenic | 21.6 J* | 20.4 J* | 8.2 J* | 21.3 J* | 25.1 J* | 19.1 J* |
| Barium | 113 | 91.4 | 70.7 | 71.6 | 222 | 213 |
| Beryllium | 1.0 B | 2.5 | 0.86 B | 1.6 | 1.3 B | 1.7 |
| Cadmium | 5.0 | 2.7 | 0.51 B | 1.1 B | 34.4 | 0.77 B |
| Calcium | 73100 J* | 58700 J* | 64200 J* | 55600 J* | 58400 J* | 93100 J* |
| Chromium | 128 JN* | 49.4 JN* | 49.6 JN* | 38.1 JN* | 532 JN* | 76.9 JN* |
| Cobalt | 10.8 B | 8.9 B | 7.8 B | 11.4 B | 13.9 B | 7.5 B |
| Copper | 174 JN* | 30.5 JN* | 30.9 JN* | 44.2 JN* | 342 JN* | 156 JN* |
| Iron | 59000 J* | 47000 J* | 19000 J* | 29700 J* | 83000 J* | 87300 J* |
| Lead | 254 | 59.9 | 76.7 | 114 | 422 | 252 |
| Magnesium | 34000 J* | 9620 J* | 28500 J* | 21900 J* | 23500 J* | 20100 J* |
| Manganese | 1190 J* | 357 J* | 1030 J* | 695 J* | 1390 J* | 2660 J* |
| Mercury | 0.34 N | 0.16 UN | 0.19 N | 0.17 N | 1.0 N | 0.39 N |
| Nickel | 72.8 | 39.9 | 24.2 | 35.1 | 131 | 46.9 |
| Potassium | 2010 * | 2710 * | 2770 * | 3330 * | 27900 * | 2890 * |
| Selenium | 1.1 U | 1.3 U | 1.0 U | 1.2 U | 1.4 U | 1.1 U |
| Silver | 3.0 | 0.91 B | 0.54 B | 1.1 B | 5.4 | 1.6 B |
| Sodium | 793 UB | 1190 UB | 636 UB | 779 UB | 1020 UB | 1570 U |
| Thallium | 1.7 U* | 1.9 U* | 1.5 U* | 2.2 B* | 2.0 U* | 1.7 U* |
| Vanadium | 21.4 JN* | 59.7 JN* | 33.0 JN* | 33.1 JN* | 29.6 JN* | 30.1 JN* |
| Zinc | 611 * | 303 * | 92.2 * | 271 * | 1490 * | 337 * |
| Cyanide | 2.0 | 0.80 U | 0.63 U | 2.3 | 3.2 | 1.8 |

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Appendix D

Land and Lakes #3

Site Photographs



Date: 9/21/93

Time: 1040

Photo Number: 1

Direction of Photo: West

Description: Lake Calumet, into which site runoff flows, as seen from the north end of the landfill.



Date: 9/21/93

Time: 1040

Photo Number: 2

Direction of Photo: Northeast

Description: View of the new cell at the eastern portion of the site, as seen from the north end of the landfill.



Date: 9/21/93

Time: 1105

Photo Number: 3

Direction of Photo: South

Description: Construction debris near the north end of the landfill.



Date: 9/21/93

Time: 1115

Photo Number: 4

Direction of Photo: West

Description: Tire shredding operation, as seen from the southern end of the landfill.



Date: 9/21/93

Time: 1115

Photo Number: 5

Direction of Photo: South

Description: At the southern portion of the landfill, garbage trucks are visible in the active cell.



Date: 9/21/93

Time: 1120

Photo Number: 6

Direction of Photo: South

Description: From the northwestern site corner, the western slope of the landfill and drainage ditch.



Date: 9/21/93

Time: 1120

Photo Number: 7

Direction of Photo: Northeast

Description: Site office, scale house, and weighing station at the southern portion of the site.



Date: 1/17/94

Time: 1100

Photo Number: 8

Direction of Photo: Northeast

Description: Sediment sample location ST07.



Date: 1/17/94

Time: 1141

Photo Number: 9

Direction of Photo: Northeast

Description: Sediment sample location ST08.



Date: 1/17/94

Time: 1310

Photo Number: 10

Direction of Photo: West

Description: Monitoring well MW-R14S,
where groundwater sample GW14 was
collected.



Date: 1/17/94

Time: 1540

Photo Number: 11

Direction of Photo: West

Description: Sediment sample location ST05.



Date: 1/17/94

Time: 1616

Photo Number: 12

Direction of Photo: North

Description: Sediment sample location ST04.



Date: 1/17/94

Time: 1625

Photo Number: 13

Direction of Photo: Southeast

Description: Monitoring well MW-GA4S, where groundwater sample GW04 was collected.



Date: 1/20/95

Time: 0915

Photo Number: 14

Direction of Photo: North

Description: Sediment sampling location ST11.



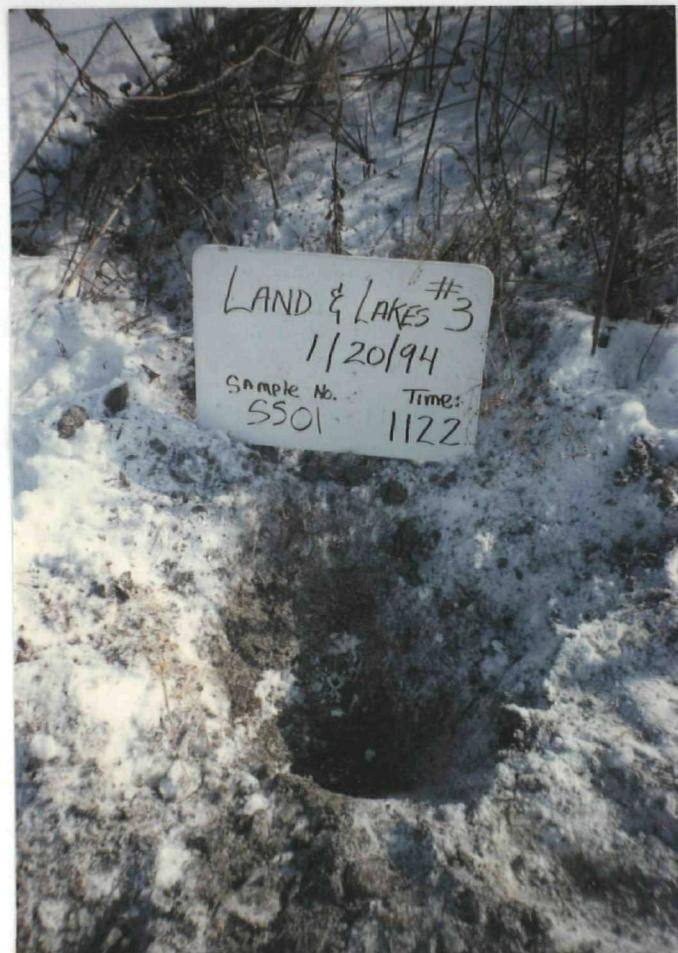
Date: 1/20/94

Time: 1125

Photo Number: 15

Direction of Photo: Southwest

Description: Soil sampling location SS01.



Date: 1/20/94

Time: 1200

Photo Number: 16

Direction of Photo: Southwest

Description: Sediment sampling location ST02.



Date: 1/20/94

Time: 1300

Photo Number: 17

Direction of Photo: Southwest

Description: Sediment sampling location ST01.



Date: 1/20/94

Time: 1305

Photo Number: 18

Direction of Photo: West

Description: Monitoring well MW-R16S, where groundwater sample GW16 was collected.



Date: 1/20/94

Time: 1515

Photo Number: 19

Direction of Photo: East

Description: Monitoring well MW-GA1S, where groundwater sample GW01 was collected.



Date: 1/20/94

Time: 1535

Photo Number: 20

Direction of Photo: West

Description: Soil sampling location SS02.



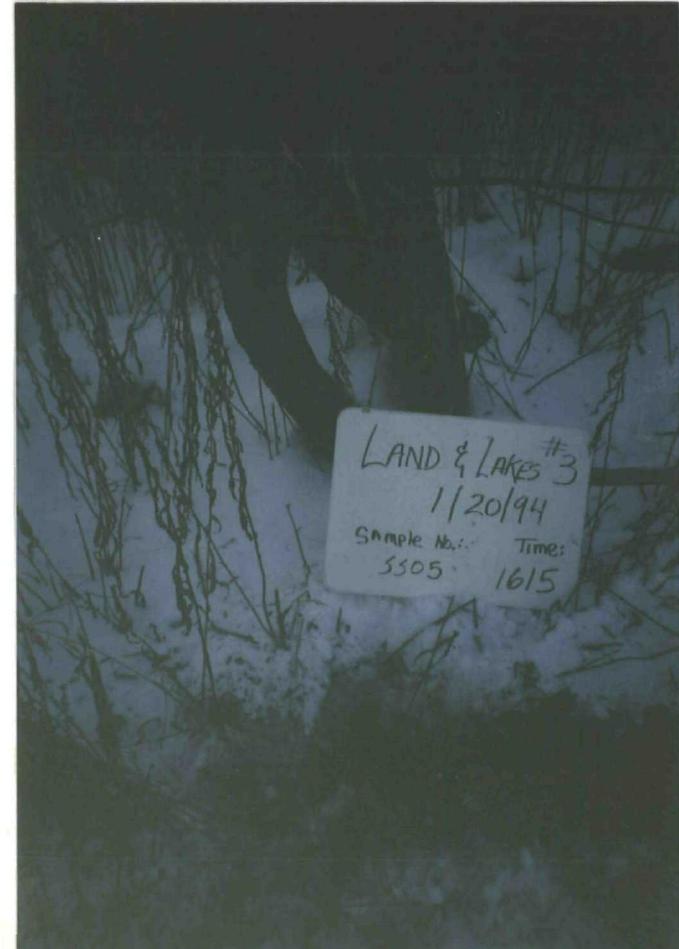
Date: 1/20/94

Time: 1615

Photo Number: 21

Direction of Photo: West

Description: Soil sampling location SS05.



Date: 1/24/94

Time: 0925

Photo Number: 22

Direction of Photo: Northwest

Description: Sediment sample location ST06.



Date: 1/24/94

Time: 1000

Photo Number: 23

Direction of Photo: West

Description: Sediment sampling location ST13.



Date: 1/24/94

Time: 1030

Photo Number: 24

Direction of Photo: Northeast

Description: Sediment sampling location ST09.



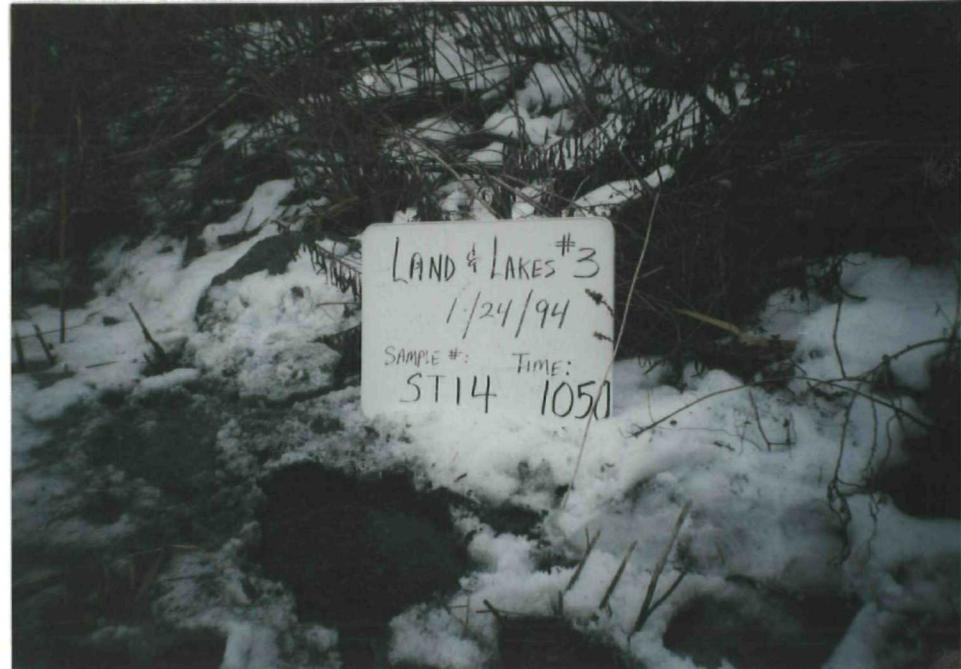
Date: 1/24/94

Time: 1050

Photo Number: 25

Direction of Photo: Southeast

Description: Sediment sampling location ST14.



Date: 1/24/94

Time: 1300

Photo Number: 26

Direction of Photo: East

Description: Sediment sampling location ST03, at the culvert outfall to Lake Calumet.



Date: 1/24/94

Time: 1345

Photo Number: 27

Direction of Photo: West

Description: Sediment sampling location ST12.



Date: 1/24/94

Time: 1425

Photo Number: 28

Direction of Photo: West

Description: Sediment sample location ST10.

